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Helpful in Graduate Continuation Courses

Graduate Continuation Courses for practicing physicians, as compiled by the Council on Medical Education and Hospitals, have become nationwide as a result of the great interest displayed in them --especially by doctors who, because of assuming new responsibilities or of returning to practice, have felt the need for such "refresher" postgraduate teaching.

The value of these courses to the medical profession cannot be overestimated. They offer unusual opportunities for doctors to bring themselves up-to-date—to learn from experienced teachers how the newer advances in clinical practice can be safely and effectively instituted to the benefit of their patients, and at a time when the most must be made of the knowledge and skill of every physician.

Books are of great and material assistance in taking these courses, and to facilitate the choice of those that you may need, we have listed on *pages 3, 4 and 5* of this issue of *The Journal* an important group of Saunders authoritative books on subjects included in these courses. We believe you will want to examine this list.

See List of SAUNDERS Books on Pages 3, 4, 5

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AN ARSENICAL WITH A BRILLIANT RECORD OF EFFECTIVENESS AND SAFETY

MAPHARSEN

PARKE, DAVIS & COMPANY, DETROIT 32, MICHIGAN

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A PANORAMIC VIEW OF THYROTOXICOSIS

REGINALD FITZ, M.D.
BOSTON

In 1923 I became interested in periodic health examinations and determined, for my own satisfaction, to discover whether or not they were of use. I believe that the periodic health examination method should be regarded seriously by the man in general practice as an important tool for clinical investigation. In light of present knowledge so little is known of the mode of origin of many diseases that to expect the periodic health examination to be very useful in preventive medicine is unsound. But it affords every doctor an opportunity to observe patients systematically over long intervals of time and thereby enables him to add new bits of medical knowledge.

To explore this idea further I have assembled a small group of patients with toxic goiter studied by this method. My attempt here is to give a narrative of this disturbance as an actual experience in their life cycle. My material consists of a group of 33 patients each of whom was thought not to have toxic goiter when first examined, and many were followed for a number of years after developing it.

THE TYPE OF INDIVIDUAL LIKELY TO DEVELOP TOXIC GOITER

The first point which seemed of interest was an attempt to discover whether any particular type of individual is likely to develop hyperthyroidism or whether it is a medical accident that may happen to any one. In this series there were 3 men. In analyzing the sex distribution in some 500 cases of exophthalmic goiter in Boston, Thompson and Means [1] found that about 20 per cent occurred in males, and Boothby,[2] reporting from the Mayo Clinic, found that about 15 per cent of the cases there were in the sterner sex; the small sampling reported here is a reasonable one from this particular point of view.

The age range of the group when they were first examined was from 65 years to 15 years, the range in height from 172.5 cm. (5 feet 8 inches) to 151 cm. (4 feet 11 inches) and the range in weight from 97.2 Kg. (214 pounds) to 46.8 Kg. (103 pounds). Therefore when they were "normal" as young or old persons they were either fat or thin and tall or short; even if one had scrutinized them with a most critical eye it would have been impossible to give any tangible reason from their appearance for thinking that many of them were necessarily predisposed to the later development of thyrotoxicosis.

Six of these persons developed thyrotoxicosis under my own eyes and 4 had been observed periodically for several years beforehand. I knew their families, a good deal about their way of life, their social and financial problems and how they ordinarily seemed to meet the everyday adventures of existence. Only 1 of them might reasonably have been suspected of later developing hyperthyroidism; she was a prominent eyed, nervous young woman, highstrung and tense, and with 2 sisters believed to have thyroid disease.

Because of this experience, microscopic as it is, I find it difficult to agree with Warthin [3] and to take recourse to the conception of a special hereditary predisposition to a "Graves' constitution" or with Moschcowitz [4] in his belief that the syndrome of thyrotoxicosis develops preponderantly in patients of the sensitive, emotional type. Rather would I say that thyrotoxicosis is a medical misadventure that may befall any one at any time. It is true that 4 of the patients had brothers or sisters with goiters—raising the familial aspects of the condition. On the whole, however, most goiter experts appear to agree with Means [5] and with Joll [6] in believing there is no real evidence that the disease is usually hereditary though inheritance may have a part—and indeed one of some importance—in its background.

THE PRECURSORS OF TOXIC GOITER

Four leads were perhaps suggestive as being precursory to what happened later. As has been mentioned, 4 patients had brothers or sisters with goiters; 7, when they were not toxic, had sufficiently developed thyroid glands to be palpable on ordinary routine physical examination; 13, excluding 2 with unmistakable signs of rheumatic heart disease, had readily audible systolic murmurs over the precordium; and 9, excluding 1 with rheumatic heart disease, had a blood pressure level on first examination higher than 140 systolic. From this meager evidence one might suspect that a "normal" individual who happens to have, when first examined, goiter in his family, a palpable thyroid gland, a precordial systolic murmur and a slightly elevated blood pressure may belong to the type most likely subsequently to develop thyrotoxicosis. But the evidence on this point is very flimsy. Sir Thomas Lewis [7] once wisely remarked that there is no justification for the not uncommon belief that every patient who has an enlarged thyroid and tachycardia has incipient toxic diffuse

Aided by a grant from the Committee on Scientific Research of the American Medical Association.

1. Thompson, W. O., and Means, J. H.: A Comparison of Exophthalmic Goiter in Boston and Chicago, J. A. M. A. **99**: 1483-1489 (Oct. 29) 1932.
2. Boothby, W. M.: Diagnosis and Treatment of the Diseases of the Thyroid Gland, in Christian, H. A., and Mackenzie, J.: New York, Oxford University Press, 1921, vol. 3, pp. 883-956.
3. Warthin, A. S.: The Constitutional Entity of Exophthalmic Goiter and So-Called Toxic Adenoma, Ann. Int. Med. **2**: 553-570 (Dec.) 1928.
4. Moschcowitz, E.: The Nature of Graves' Disease, Arch. Int. Med. **46**: 610-629 (Oct.) 1930.
5. Means, J. H.: The Thyroid and Its Diseases, Philadelphia, J. B. Lippincott Company, 1937.
6. Joll, C. A.: Diseases of the Thyroid Gland, St. Louis, C. V. Mosby Company, 1932.
7. Lewis, T.: The Soldier's Heart and the Effort Syndrome, New York, Paul B. Hoeber, 1919.

goiter. Certain writers, he said, imbued with recent endocrinologic doctrines, are but too ready to regard every enlarged thyroid gland as an overacting gland; these writers seem unaware how frequently a palpable thyroid is present in soldiers and civilians who suffer from no symptoms.

Seventeen years ago I examined for one of the Boston colleges a group of 110 apparently healthy young women. Of these, 54 (49 per cent) appeared entirely normal, 9 (8 per cent) had a blood pressure reading of more than 140 systolic on casual examination, 27 (25 per cent) had palpable thyroid glands and 33 (29 per cent) had audible systolic murmurs.

TABLE 1.—*Findings in a Group of Patients Examined Before They Were Considered to Have Thyrotoxicosis*

No.	Sex	Family History of Goiter	Thyroid	Heart	Blood Pressure	Age	Weight, Kg.	Height, Cm.
1	♀	Sister had goiter	Not felt	Systolic murmur	160/ 90	65	65.5	163.3
2	♀	Negative	Not felt	Negative	130/ 70	58	97.2	156.5
3	♀	Negative	Not felt	Negative	145/ 80	57	60.8	167.5
4	♀	Negative	Not felt	Systolic murmur	160/105	55	84.0	163.1
5	♀	Negative	Not felt	Systolic murmur	170/100	53	65.0	152.0
6	♀	Negative	Not felt	Negative	160/ 90	46	....	170.0
7	♀	Negative	Not felt	Systolic murmur	140/ 70	44	46.8	160.0
8	♂	Negative	Not felt	Negative	110/ 70	43	67.0	.....
9	♀	Negative	Not felt	Negative	130/ 80	43	54.5	161.0
10	♀	Negative	Not felt	Systolic murmur	135/100	39	66.5	162.8
11	♀	Negative	Not felt	Systolic murmur	140/100	38	49.5	154.0
12	♀	Negative	Not felt BMR —18	Negative	110/ 70	38	83.5	172.5
13	♀	Negative	Not felt	Negative	120/ 70	36	54.5	150.9
14	♀	Negative	Palpable	Negative	120/ 70	35	51.5	164.5
15	♀	Negative	Palpable	Negative	140/100	35	71.7	161.4
16	♀	Negative	Not felt	Systolic murmur	120/ 70	35	75.0	158.5
17	♀	Negative	Not felt	Systolic murmur	150/ 90	34	75.0	164.0
18	♀	Brother had goiter	Palpable BMR —2	Negative	100/ 70	31	56.0	160.3
19	♀	Sister had goiter	Not felt	Systolic murmur	.....	29	....	166.4
20	♀	Negative	Palpable	Systolic murmur	125/ 70	27	56.8	157.5
21	♀	Negative	Not felt	Negative	135/ 80	27	49.5	161.5
22	♀	Negative	Palpable	Negative	115/ 80	26	57.7	151.4
23	♀	Negative	Not felt	Negative	100/ 70	25	....	162.0
24	♀	Negative	Not felt	Negative	120/ 80	25	65.8	169.5
25	♂	Negative	Not felt	Negative	120/ 80	24	65.5	171.0
26	♀	Negative	Not felt	Rheumatic heart disease	120/ 60	24	65.9	162.0
27	♀	Sister had goiter	Not felt	Negative	.....	24	56.8	162.6
28	♀	Negative	Palpable	Rheumatic heart disease	140/ 70	23	61.5	168.4
29	♀	Negative	Not felt	Systolic murmur	105/ 80	20	52.3	165.2
30	♀	Negative	Not felt	Negative	115/ 75	20	57.3	165.0
31	♀	Negative	Not felt	Systolic murmur	106/ 70	19	55.5	158.5
32	♀	Negative	Palpable	Negative	110/ 70	17	66.5	158.0
33	♂	Negative	Not felt	Systolic murmur	100/ 60	15	....	168.7

The combination in different individuals of murmurs, palpable glands and increased blood pressure varied greatly; one young woman had all these findings, lacking only a history of goiter in her family to make of her a reasonable suspect according to this way of reckoning. During the past seventeen years she has married, has had three children and up to the present time has not developed hyperthyroidism.

THE EARLY MANIFESTATIONS OF TOXIC GOITER

A second interesting point was the manner in which the manifestations of thyroid toxicity seemed to become evident. Six patients appeared to develop symptoms of thyrotoxicosis suddenly: after infection in 2 instances, after an attack of asthma in another, after the mental shock of her husband's death in a fourth case, and for no obvious reason in the fifth and sixth. The 28 others, in contrast, appeared to develop symptoms uncomfortable enough to make them seek medical advice for hyperthyroidism with varying degrees of insidiousness—indeed so insidiously in 4 cases that the diagnosis was established through an incidental finding of an elevated metabolic rate only after prolonged observation lasting over a period of several years.

The possible role of infection in awakening thyrotoxicosis is so well recognized as not to be worth mentioning; certainly almost any infection may bring to light latent hyperthyroidism and may exaggerate the fully developed condition. Rosenow [8] is the only bacteriologist who has claimed to find a specific organism that might produce it, and his observations have never received very serious consideration.

The relation of asthma to hyperthyroidism also has been commented on repeatedly. Indeed, Widal and Abrami [9] once claimed that the asthmatic hyperthyroid could often be cured of asthma by irradiation of the thyroid gland, an observation which has not received wide confirmation.

Mental shock as a trigger mechanism is always brought up in discussions on the exciting causes of thyrotoxicosis. Bram [10] believed that he discovered evidence of psychic trauma in 85 per cent of his cases; on the other hand, no great increased incidence of the disease was reported in England as an aftermath of the war of 1914-1918 when conditions might well have stimulated it, and no writer has yet claimed to prove that the weight of worry and emotional strain imposed on those developing thyrotoxicosis is measurably heavier than that imposed on the general population. Therefore it seems that all there is to say is that what actually caused hyperthyroidism to develop in any of the cases reported here is entirely unknown, just as is true of other cases described in the literature.

The age at which these patients developed thyrotoxicosis covered a wide span of years, but the majority developed it in the third and fourth decades. This also is typical, according to the tables of Thompson and Means [1] and the statistical analysis of Gardiner-Hill.[11]

The physical changes that were encountered are readily predictable; in almost every instance there were varying degrees of thyroid enlargement, tachycardia, elevated pulse pressure and presence of a precordial systolic murmur or its exaggeration had it been audible previously.

The amount of weight loss varied. One patient lost 30 kilograms (approximately 66 pounds) in a short space of time, whereas others showed relatively little in the way of weight loss. The data on this point are unconvincing, since many of the patients were examined as "normal" individuals several years before they had hyperthyroidism and thus their exact weight when symptoms of thyrotoxicosis began is not known.

In glancing at the table the most striking feature noted is the frequency with which symptoms related to the cardiovascular system were encountered. The combination of nervousness—at best an ill defined term—breathlessness, palpitation and even cardiac decompensation was not infrequently found. This fact is worth emphasizing, because in the modern clinic

8. Rosenow, E. C.: The Newer Bacteriology of Various Infections as Determined by Special Methods, J. A. M. A. **63**: 903-908 (Sept. 12) 1914.

9. Widal, F., and Abrami, P.: Asthme et hyperthyroidisme, Presse méd. **32**: 473-476 (May 31) 1924.

10. Bram, I.: Psychic Trauma in Pathogenesis of Exophthalmic Goitre, Endocrinology **11**: 106-116 (March-April) 1927.

11. Gardiner-Hill, H.: An Aetiological Study of Primary Graves' Disease with Special Reference to the Significance of the Sex Events of the Female, Quart. J. Med. **22**: 217-236 (Jan.) 1929.

TABLE 2.—*The Apparent Mode of Onset by Which Thyrotoxicosis Was Recognized and the Obvious Changes It Produced*

Case No.	Thyroid Palpable		Systolic Murmur		Blood Pressure		Age		Weight		Basal Metabolic Rate	Comment
	Before	After	Before	After	Before	After	Before	After	Before	After		
1	No	Yes	Yes	Yes	160/ 90	160/ 90	65	66	65.5	64.9	+21	Gradual onset of weakness and nervousness complicated by auricular fibrillation
2	No	Yes	No	Yes	130/ 70	140/ 80	58	63	97.2	66.3	+51	Became suddenly nervous at death of her husband and this exaggerated by death of her son; rapid loss of weight
3	No	Yes	No	Yes	145/ 80	180/ 70	57	60	66.8	62.6	+38	Gradual onset of shortness of breath and easy fatigue with nervousness
4	No	Yes	Yes	Yes	160/105	190/110	55	63	84.0	64.5	+53	Gradual onset of nervousness and weight loss apparently following an upper respiratory infection
5	No	Yes	Yes	Yes	170/100	185/115	53	59	65.0	65.0	+53	Gradual onset of nervousness and exophthalmos
6	No	Yes	No	Yes	160/ 90	185/115	46	59	....	65.9	+27	Gradual onset of nervousness and later exophthalmos
7	No	Yes	Yes	No	140/ 70	190/100	44	53	46.8	45.3	+70	Gradual onset of nervousness; developed later thyroid enlargement and exophthalmos
8	No	No	No	No	110/ 70	110/ 60	43	51	67.0	68.5	....	Precordial pain; basal metabolic rate of +60 an incidental finding
9	No	Yes	No	No	130/ 80	150/ 60	43	49	54.5	56.7	+55	Suddenly noticed nervousness and tachycardia after respiratory infection; a few months later became conscious of goiter
10	No	Yes	Yes	Yes	135/100	130/ 70	39	46	66.5	52.0	+52	Gradual onset of indigestion, later complicated by enlargement of thyroid, nervousness and palpitation
11	No	No	Yes	Yes	140/100	116/ 70	38	41	49.5	39.0	+53	Had symptoms of cardiac decompensation; exophthalmos noted; thyrotoxicosis discovered by basal metabolic rate
12	No	No	No	Yes	110/ 70	125/ 60	38	43	83.5	71.7	+24	Basal metabolic rate —18 when first seen; gradual onset of fatigue, nervousness and weight loss
13	No	Yes	No	Yes	120/ 70	150/ 62	36	43	54.5	45.4	+52	Basal metabolic rate +8 when first seen; sudden onset of nervousness, palpitation and weight loss at time of menopause
14	Yes	Yes	No	No	120/ 70	130/ 64	35	36	51.5	48.1	+34	Sudden onset of swelling of thyroid following tonsillitis with nervousness, tachycardia, exophthalmos and weight loss
15	Yes	Yes	No	Yes	140/100	130/ 90	35	40	71.7	65.0	+23	Gradual onset of nervousness, tremor and tachycardia
16	No	Yes	Yes	Yes	120/ 70	150/ 70	35	37	75.0	65.8	+52	Gradual onset of nervousness, tachycardia and weight loss
17	No	Yes	Yes	Yes	150/ 90	150/ 90	34	37	75.0	48.2	+62	Sudden onset; became suddenly nervous, developed palpitation and great loss of weight after an attack of asthma
18	Yes	Yes	No	Yes	100/ 70	130/ 70	31	33	56.0	57.2	+41	Basal metabolic rate —2 when first seen; gradual onset of increasing nervousness and tachycardia
19	No	Yes	Yes	Yes	.....	125/ 70	29	30	....	60.5	+25	Gradual onset about six months before entry to hospital of nervousness, weariness, development of goiter and exophthalmos
20	Yes	Yes	Yes	Yes	125/ 70	130/ 70	27	29	56.8	55.0	+46	Basal metabolic rate +9 when first seen; gradual onset of increasing nervousness with palpitation and increase in size of thyroid
21	No	Yes	No	Yes	135/ 80	175/ 90	27	38	49.5	51.8	+60	Gradual onset of increasing nervousness, fatigue and palpitation; loss of 4 Kg. in weight from maximum before illness began
22	Yes	Yes	No	No	115/ 80	132/ 70	26	39	57.7	60.5	+20	Gradual onset of nervousness and loss of weight (18.2 Kg. from maximum during interval)
23	No	?	No	No	100/ 70	120/ 90	25	28	....	62.2	+28	Gradual onset of fatigue, tremor and palpitation
24	No	Yes	No	No	120/ 80	120/ 60	25	29	65.8	68.5	+30	Gradual onset of nervousness and undue fatigue complicated by slight diarrhea; finally noticed swelling in neck
25	No	No	No	Yes	120/ 80	140/ 80	24	36	65.5	72.2	+30	Gradual onset of attacks of precordial pain on exertion and nervousness; basal metabolic rate —9 five years before hyperthyroidism recognized
26	No	Yes	Yes	Yes	120/ 60	150/ 50	24	33	65.9	64.3	+44	Was known to have rheumatic heart disease, and finally hyperthyroidism was suspected
27	No	Yes	No	Yes	.....	120/ 80	24	32	56.8	59.1	+35	Gradual onset of increasing nervousness and irritability with tremor and palpitation developing during previous year
28	Yes	Yes	Yes	Yes	140/.70	140/ 70	23	31	61.5	64.5	+28	Was known to have rheumatic heart disease, and finally hyperthyroidism was recognized after several years' observation
29	No	Yes	Yes	Yes	105/ 80	130/ 70	20	33	52.3	51.3	+33	Gradual onset of nervousness exaggerated by automobile accident and later complicated by ease of fatigue
30	No	Yes	No	Yes	115/ 75	130/ 60	20	24	57.3	54.0	+37	Gradual onset of increasing nervousness accompanied by loss of weight, shortness of breath and rapid pulse rate
31	No	Yes	Yes	Yes	106/ 70	150/ 60	19	25	55.5	49.1	+48	Gradual onset of nervousness and palpitation with slight dyspnea on exertion
32	Yes	Yes	No	Yes	110/ 70	130/ 50	17	22	66.5	59.0	+71	Gradual onset of exaggeration of swelling in her neck followed by attacks of palpitation and weight loss
33	No	Yes	Yes	Yes	100/ 60	120/ 60	15	19	....	58.2	+67	Sudden onset four months previously of nervousness, palpitation, swelling in neck and exophthalmos

patients with hyperthyroidism masked by some other disease are the least easily recognized.

On the whole, there was nothing particularly remarkable about any of the cases and they add nothing new. They developed hyperthyroidism acutely or slowly; evidently it is a difficult matter to recognize "early" hyperthyroidism, probably because a patient developing it is at first stimulated and may feel unusually well. Only after it exists for some time so as to wear a patient down or unless it is notably acute does it make any one feel ill enough to seek medical advice, and by this time usually it is easily recognized.

TABLE 3.—*Cases of Thyrotoxicosis with Recovery*

Case No.	Treatment	Date of Present Note	Comment
4	Subtotal thyroidectomy	4 years after operation	Feels well; has gained 15.5 Kg.
5	Subtotal thyroidectomy	17 years after operation	Death from abdominal carcinomatosis; at no time since operation any symptoms of hyperthyroidism
8	Subtotal thyroidectomy (thyrocardiac)	10 years after operation	Death in heart failure; at no time since operation any symptoms of hyerthyroidism
9	Subtotal thyroidectomy	19 years after operation	Feels well; at no time since operation any symptoms of hyperthyroidism; has gained 5.8 Kg.
11	Subtotal thyroidectomy (thyrocardiac)	14 years after operation	Death in heart failure; at no time since operation any symptoms of hyperthyroidism
12	Iodine therapy alone	12 years after hyperthyroidism suspected	Continues well; no symptoms of recurrence; no change in weight
14	Subtotal thyroidectomy	11 years after operation	Feels well; at no time since operation any symptoms of hyperthyroidism; has gained 8.2 Kg.
20	Subtotal thyroidectomy	4 years after operation	Feels well; at no time since operation any symptoms of hyperthyroidism
22	Subtotal thyroidectomy	14 years after operation	Feels well; at no time since operation any symptoms of hyperthyroidism; has gained 8.6 Kg.
23	Irradiation	18 years after hyperthyroidism suspected	Feels well; at no time since treatment any symptoms of hyperthyroidism
24	Subtotal thyroidectomy	17 years after operation	Feels well, at no time since operation any symptoms of hyperthyroidism; has gained 11.4 Kg.
28	Subtotal thyroidectomy (thyrocardiac)	7 years after operation	Feels well; at no time since operation any symptoms of hyperthyroidism; no change in weight
29	Subtotal thyroidectomy	11 years after operation	Feels well; at no time since operation any symptoms of hyperthyroidism; has gained 10 Kg.
33	Subtotal thyroidectomy	6 years after operation	Feels well; at no time since operation any symptoms of hyperthyroidism; has gained 23.8 Kg.; basal metabolic rate —7

THE IMMEDIATE RESULTS OF TREATMENT IN TOXIC GOITER

The third and most interesting point is what happened to the patients after they developed hyperthyroidism. Strangely enough, this is difficult to evaluate and is largely a matter of individual conjecture. In the days before the chances of successful surgery were as good as they now are and operations were not popular, clinicians paid much attention to the natural history of the disease. Its relapsing character was well recognized, and as long ago as 1913 H. S. Plummer [12] attempted to show that relapses and remissions tended to occur in fairly regular cycles and that consideration of this should play a part in the wisest choice of therapy. A few years later Barker [13] introduced the thought that thyrotoxicosis, no matter how it is treated, tends to "burn itself out," whatever that phrase may mean, and this tendency toward spontaneous improvement of symptoms must play a part in evaluating therapeutic results. Going back into even more ancient days, one can easily find observers who thought that the natural history of thyrotoxicosis was to end in myxedema and others who felt that complete recovery was the rule unless the patient died first of heart failure or vascular disease or from some intercurrent infection. Thus almost anything that may happen to a patient under treatment has been prevoiusly reported as part of the ordinary behavior of the disease, and all this makes the proper evaluation of therapeutic results the more difficult.

As thyroid surgery was developed, pathologists had opportunity to study thyroid glands removed under a variety of clinical conditions. It is bewildering to read descriptions of thyroid histology in connection with thyrotoxicosis and even more bewildering to attempt to compare the illustrations that have been used to demonstrate the different changes that have been described. In this country our pathologists in the main seem to be agreed that in the toxic glands they study there are likely to be changes in the character of the epithelium lining the acini and in the colloid, and that these changes are accompanied or followed by more or less fibrosis and infiltration of lymphocytes so that the normal architecture of the gland is altered in the direction of a chronic inflammatory process. They also agree that the age of the patient, the part of the country from which he comes and the duration of his hyperthyroidism bear a relation to what they see; and they know from the very convincing work of Rienhoff [14] that the administration of iodine to the hyperplastic gland can produce recognizably regressive changes in its appearance. Beyond this point the going is harder, the underlyng thyroid pathology of thyrotoxicosis is less certain, the various classifications of hyperplastic goiters are more difficult to appreciate and, to end up with, there are only the rarest reports of what the treated thyroid gland looks like at the patient's death.

When results of treatment are evaluated by clinicians, one runs afoul of uncertainty regarding the criteria that are used. It is clear that with any treatment two unpleasant happenings are encountered with varying degrees of frequency: the development of postherapeutic hypothyroidism or of recurrences of thyrotoxicosis. And even in the cases that are reported as having been "cured" the definition of "cure" is debatable. Rasmussen [15] has written an interesting paper in which he reminds us that because a patient with thyrotoxicosis subsequently develops a normal rate of metabolism, gains weight and is able to resume his work, yet no "cure" need have been accomplished. For such patients, he believes, are likely to be left with residual changes in personality and nervous makeup which he regards as part of the thyrotoxic syndrome and which he thinks are enduring and fully as disturbing as the metabolic aspects of the disorder.

Greene and Hurxthal [16] have suggested a follow-up plan for the study of goiter which is admirable. In speaking of recurrences they say that to report a certain number of these episodes among a group of cases

12. Plummer, H. S.: The Clinical and Pathological Relationship of Simple and Exophthalmic Goitre, Am. J. M. Sc. **146**: 790-795 (Dec.) 1913.

13. Barker, L. F.: Exophthalmic Goitre, Internat. Clin. **1**: 1-16 (March) 1924.

14. Rienhoff, W. F., Jr.: Microscopic Changes in Thyroid Gland by Oral Administration of Desiccated Thyroid, Arch. Surg. **41**: 487-507 (Aug.) 1940; Changes Induced in Patients with Hyperthyroidism by the Oral Administration of Desiccated Thyroid, Bull. Johns Hopkins Hosp. **68**: 538-542 (June) 1941.

15. Rasmussen, H.: Morbus Basedowi (Graves' Disease), Acta med. Scandinav. **91**: 69-106 (Jan.) 1937.

16. Greene, A. H., and Hurxthal, L. M.: Postoperative Follow-Up Study of 469 Thyrocardiac Patients, New England J. Med. **225**: 811-816 (Nov. 20) 1941.

within a given period of time does not mean much, for the chances of later recurrences are by no means ended. The final estimate of what thyrotoxicosis is and what it does to a patient cannot be made until the whole life history of that individual is known. It is from this point of view that I have attempted to study the cases in my particular group.

Four patients have been lost track of, and 1 developed a fatal postoperative thyroid crisis. Thus only 28 of the series yield information as to the late effects of thyrotoxicosis.

Table 3 summarizes the apparently satisfactory results obtained in 14 cases. All but 4 of the patients were followed for ten years or more after the diagnosis of hyperthyroidism was established, so that temporarily beneficial effects of treatment have not been included. Case 8 is of especial interest because the thyroid gland was examined by the pathologist when it was hyperactive and ten years later when the patient died.

THE END RESULTS OF TOXIC GOITER TREATED BY SURGERY

M. W. first entered the Peter Bent Brigham Hospital when he was 43 years old, a previously healthy business man who consulted the hospital for pain in his flank. He weighed 67 Kg. His neck was in no way remarkable. His heart seemed normal. His blood pressure was 110/70. He was found to have a double inguinal hernia, and it was suspected that he had a renal calculus.

He reentered eight years later. During the interval he had developed attacks of choking sensations at night and of precordial pain by day brought on by exertion. About eight weeks previously he had suffered a coronary occlusion.

He now weighed 68.5 Kg. The thyroid was not enlarged and still appeared in no way remarkable. The blood pressure was 108/62. There were no cardiac murmurs, though now the heart seemed slightly enlarged. An electrocardiographic tracing showed an abnormal form of ventricular complex. The basal metabolic rate was increased, falling with iodine from + 60 to + 40.

He had a successful subtotal thyroidectomy performed in two stages with a satisfactory drop in metabolic rate to — 8. Microscopic examination of the gland revealed a picture entirely characteristic of primary hyperplasia.

Ten years after these operations and eighteen years after his first entry to the Peter Bent Brigham Hospital he returned there. He had felt entirely well until a year previously, having nine years of relief from all symptoms referable to his heart. Then, little by little, he noticed a sense of heaviness in his legs and of undue fatigue on exertion, soon followed by what he termed "uncomfortable spells" after a large meal and finally, for a few weeks, by attacks of nocturnal dyspnea accompanied by a feeling of tightness in his chest.

His weight now was 74.2 Kg. The thyroid was not palpable. The blood pressure was 130/90. There were no cardiac murmurs, though the heart had become notably enlarged. An electrocardiographic tracing gave curves typical of left bundle branch block. The basal metabolic rate was + 14; the complete accuracy of this test is open to question since the patient found the mask difficult to bear, and thus probably the reported figure is higher than actually obtained. He died of heart failure after remaining in the hospital for nearly a month.

The thyroid gland weighed 11 Gm. On microscopic examination the picture was that of notable inactivity. The acini were dilated and filled with dense basic staining colloid. The epithelium was low cuboidal. At the periphery of the gland were small atrophic acini with desquamated epithelium.

It is remarkable how difficult it is to find case reports such as this. Here subtotal thyroidectomy induced symptomatic relief for the rest of the patient's life and from that point of view represented a cure. Yet the thyroid gland after the operation did not regenerate and grow to look like the normal thyroid of a 61 year old man. On the contrary, it gave every appearance of atrophy and, had life continued long enough, might well have finally caused what Sir William Gull [17] termed "a cretinoid state supervening in adult life." Scarcello and Goodale [18] reported a somewhat similar case. Their patient, a young woman, had in 1926 "primary hyperplasia of the thyroid gland, follicular type," with a basal metabolic rate of + 41. Subtotal thyroidectomy was performed. She died thirteen years later, eventually developing clinical myxedema. They found that the thyroid now was chiefly represented by disorganized masses of Hürthle's cells with lymphocytic infiltration about them. Are such findings the usual pathologic end results of thyrotoxicosis treated by surgery and, if so, do they represent the best that can be hoped for?

(To be continued)

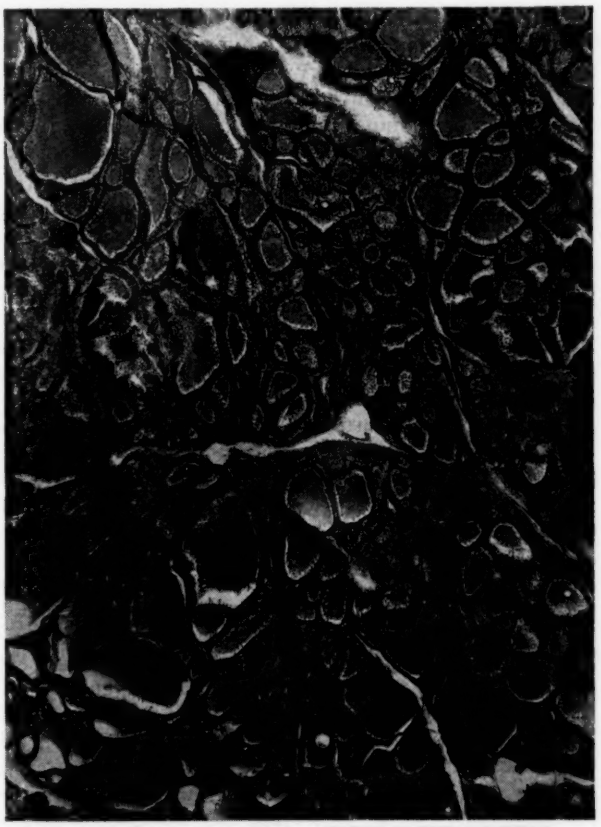

Fig. 1.—End result on the thyroid gland of thyrotoxicosis treated by surgery: Section of thyroid gland removed at operation, reduced from a photomicrograph with a magnification of 50 diameters. The gland is diffusely hyperplastic. There are numerous areas of epithelial hyperplasia with the formation of papillary projections. There is moderate general increase of connective tissue throughout. (Courtesy of Drs. Shields Warren and S. B. Wolbach.)

17. Gull, W.: On a Cretinoid State Supervening in Adult Life in Women, Tr. Clin. Soc. London **7**: 180-185, 1874.
18. Scarcello, N. S., and Goodale, R. H.: Struma Lymphomatosa: Report of a Case Complicated by Myxedema, New England J. Med. **224**: 60-64 (Jan. 9) 1941.

History of Dermatology.—Dermatology in the United States until the last quarter of the nineteenth century was a reflex of European dermatology; in the first half of the century English and French, and after 1860 German, especially Viennese. —Pusey, William Allen: The History of Dermatology, Springfield, Ill., Charles C Thomas, 1933.

THE SIGNIFICANCE OF THE FEBRILE REACTION IN INFLUENZA

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AND
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Some years ago one of us [1] in a paper on influenza said "One very firm impression I have formed, though I have no statistics to confirm it, is that the higher the initial temperature, the more quickly it is apt to subside."

This impression crystallized gradually as a result of repeated epidemics following the great pandemic of 1918-1919 and was emphasized by the experience of 1 patient in particular. This woman, a nurse, had an attack of influenza every January for five or six consecutive years. Every attack except one began insidiously and the temperature rarely exceeded 100 F., more often remaining under 99 F. Her stay in the hospital varied from twelve to fifty-six days, and an additional month was usually needed to make her fit for duty. Finally she had an attack which began with a sudden onset and a temperature of 102.6 F. The fever lasted less than two days. This time she was a hospital patient for only five days, and a week from the onset she was back on duty in good condition. The temperature curve shown in chart 1, although that of another patient, is almost identical with hers on that occasion.

In an effort to determine whether there is any ground for the impression that a high initial temperature is a good prognostic sign in influenza, a study of 50 cases of uncomplicated influenza was carried out at the North Carolina Baptist Hospital during the epidemic in the winter of 1943-1944.

Our criteria for making a diagnosis of influenza included pharyngitis, malaise, fever, chills or chilly sensations, backache or aching pains elsewhere, asthenia and a low or normal leukocyte count. The leukocyte count averaged approximately 6,000 per cubic millimeter, the highest count being 9,000 and the lowest 2,400. It is of passing interest that the 4 patients in the series who were treated with sulfonamides (sulfadiazine and sulfamerazine) had an average leukocyte count of only 3,900.

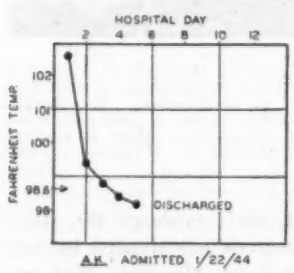

Chart 1.

Chart 1.—Temperature of A. K., showing the febrile response typical of patients in group A.

Half of the cases studied (group A) had a relatively sudden onset, while the other half (group B) were relatively insidious in onset. The 25 patients in the latter group had prodromal symptoms for one-half to three days before being actually confined to bed. The others became quite ill within a twelve hour period. In all cases the maximum fever was reached within the first three days of the disease, and usually on the first day. Frank chills were more common in the group which had a sudden onset of symptoms.

From the Department of Medicine, Bowman Gray School of Medicine of Wake Forest College, and the North Carolina Baptist Hospital.

1. Johnson, W. M.: Influenza: Some Observations and Impressions, South. Med. & Surg. **98**: 513-517 (Oct.) 1936.

The fact of major interest to us was the much more pronounced febrile response shown by the patients who had a sudden onset of symptoms. The temperature curve of A. K. (chart 1) is typical of this group of patients. The average maximum temperature in this group was 102.1 F. as compared with an average maximum temperature of 100 F. in group B (chart 2). In the former group the average duration of fever (temperature over 99 F.) was only 1.84 days, but in the latter group the average was 2.08 days. Although this difference is slight, it does indicate that high fever in uncomplicated influenza is not a bad prognostic sign.

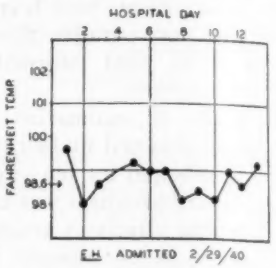

Chart 2.

Chart 2.—Temperature of E. H., showing the febrile response typical of patients in group B.

Of more significance is the difference in the length of hospital stay for the two groups. The average period of hospitalization for the patients with the higher febrile response and sudden onset of symptoms was approximately two days shorter than that for those in group B. The average length of hospital stay for the patients in group A was only 4.88 days, as opposed to 6.44 days for the other group.

According to the Committee on the Costs of Medical Care, upper respiratory infections (including influenza) are responsible for approximately 62 per cent of disabling illness. It might be emphasized at this point that, after the period of complete disability caused by influenza is over, there is still a relatively long period of partial disability due to the so-called asthenic state. It was generally observed that the asthenic state persisted much longer in the group with the lower febrile response. Two patients in this group are known to have had relapses after discharge from the hospital, requiring at least an additional week of bed rest.

In view of the apparently more rapid recoveries from influenza in the group of patients showing the greater febrile response, we hope that fever therapy may be tried in a series of test cases during a future epidemic.

SUMMARY AND CONCLUSIONS

A series of 50 cases of influenza, 49 of which occurred during the winter of 1943-1944, have been studied.

Exactly one half of the cases were sudden in onset (group A), while the remaining half began insidiously (group B).

In group A an average maximum temperature of 102.1 F. was encountered, while in group B the maximum was only 100 F.

The average hospital stay for group A was 4.88 days, while for group B it was 6.44 days.

The postinfluenzal asthenic state was apparently more pronounced in group B, and at least 2 of the 25 patients in this group suffered relapses after discharge from the hospital.

Well controlled fever therapy may be of value in circumventing the asthenic state.

Sulfonamides are not indicated in uncomplicated influenza and apparently serve to enhance the preexisting leukopenia. Unless daily leukocyte counts can be done, the use of sulfonamides in uncomplicated influenza is contraindicated.

IMMUNITY RESPONSES TO MIXTURES OF DIPHTHERIA TOXOID AND PERTUSSIS VACCINE

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The routine injection of diphtheria toxoid during the latter part of the first year of life has almost completely eliminated diphtheria in most localities; and, during the time that infants after the age of 7 months have been injected with potent pertussis vaccine, whooping cough morbidity and mortality have decreased at an encouraging rate.

Because diphtheria and whooping cough are most prevalent and serious in the first years of life, it seemed logical that immunization against the two diseases should be attempted at the same time by the injection of mixtures of diphtheria toxoid and potent pertussis vaccine. When this investigation was begun in 1938 only Bordet [1] had published a brief report on the use of a mixture; but he gave no data on immunity tests for either disease nor did he report clinical evidence of protection.

A satisfactory mixture of these antigens when injected subcutaneously should not be followed by a severe systemic or local reaction. It should produce a high incidence of prolonged protection against each disease. The duration of immunity should approximate that when each antigen is injected singly (at different times) or when injected simultaneously (separately). The component antigens should be stable for at least a year. If effective, the number of injections for the protection against these two diseases could thus be cut in half. The mixture should be safe for general use in institutions, health department clinics and private practice.

In a preliminary paper in 1941 we [2] reported the simultaneous administration of diphtheria toxoid and pertussis vaccine in young children. The antigens were administered in separate syringes or mixed in the same syringe. At the Evanston Health Department Immunization Clinic three doses of the two antigens were injected at the same time into 464 infants, beginning at 8 months of age. Because the negative Schick test and the 3 plus or 4 plus pertussis complement fixation test had been accepted by the greatest number of investigators as evidence of adequate diphtheria and pertussis antibody responses, we used them as evidence of conferred protection. It had been found [3] that an appreciable percentage of infants did not develop antibodies from three doses of potent pertussis vaccine injected subcutaneously before 6 months of age at weekly intervals.

Systemic (febrile) and local reactions occurred in a small percentage of cases as they did with plain pertussis vaccine (15,000 million bacilli per cubic centimeter). Schick tests were read seventy-two hours after 0.1 cc. of Schick test material was injected intracutaneously on the flexor surface of the forearm. Diphtheria antitoxin concentration levels were determined early in the study, but the determinations were discontinued after it was found that they usually coincided rather closely with the Schick test readings. Pertussis agglutination tests (Mathieson technic and the rapid slide method) were performed but were excluded because the peak occurred weeks later than that of the complement fixation tests.

The preliminary Schick test (before the first injection) was positive in 96 per cent of the infants; the preliminary pertussis complement fixation test [4] was negative in 95 per cent. When retested six weeks after the final dose, infants injected simultaneously (antigens separate) showed 98 per cent of the Schick tests negative, and 91 per cent had 3 plus or 4 plus complement fixation. Infants injected with the mixed antigens showed 95 per cent of the Schick tests negative, and 73 per cent had 3 plus or 4 plus complement fixation. After a "stimulating" dose of 2 cc. of plain pertussis vaccine (15,000 million bacilli per cubic centimeter) all infants who had less than 3 plus acquired 3 plus or 4 plus complement fixation. Forty-four infants who had had negative Schick tests and 3 plus or 4 plus complement fixation after the injection of mixed antigens were retested one to two years later. Their Schick tests and pertussis complement fixation tests still showed high immunity responses; reversion of the tests had not occurred. Up to July 1944 none of these 464 infants inoculated between 1938 and 1941 were known to have developed either disease.

TABLE 1.—*Immunity Responses After Separate Diphtheria Toxoid and Pertussis Vaccine, Simultaneous*

Total dose: 3 cc. (1, 1 and 1 cc.) diphtheria toxoid and 7 cc. (2, 2 and 3 cc.) H. pertussis vaccine (15,000 million bacilli per cubic centimeter) separate

	Number Children Tested	Interval Between 3 Doses, Weeks	Negative Schick Test, per Cent	3+ or 4+ Pertussis Complement Fixation, per Cent
St. Vincent's Orphanage.....	100	1	91	69*
Evanston Health Department.....	98	3	97	97†

* Three weeks after a "stimulating" dose of vaccine (2 cc. 15,000 million bacilli per cubic centimeter), 71 per cent.

† One hundred per cent of the infants with complement fixations less than 3+ became 3+ or 4+.

The investigation has been continued to determine which mixture, dose and time interval gave the highest immunity response without severe reactions. Various

From the Northwestern University Medical School and the Evanston Department of Health.

1. Bordet, J.: Concerning Whooping Cough Vaccine, Bruxelles méd. **16**: 503, 1936; personal communications to the authors.

2. Sauer, L., and Tucker, W.: Simultaneous Administration of Diphtheria Toxoid and Pertussis Vaccine in Young Children, Am. J. Pub. Health **32**: 385, 1942.

3. Sauer, L.: The Age Factor in Active Immunization Against Whooping Cough, Am. J. Path. **17**: 719, 1941.

4. To obtain blood from young infants for the complement fixation or agglutination tests, the infant lies on the abdomen. A foot (or hand) should be warm. The big toe or middle finger is rubbed with a sterile gauze square saturated with 70 per cent alcohol, then dried with sterile gauze. A large Hagedorn needle (4⅜ inch) is removed from 70 per cent alcohol and wiped dry on sterile gauze. Just before the skin is pricked the toe or finger is constricted with the left thumb and index finger. With the cutting edge upward the needle pricks deeply opposite the base of the nail about 0.5 cm. from the lateral margin of the nail. The needle is brought upward toward the tip of the toe or finger, so that the incision is superficial where the needle leaves the skin. After the required amount of blood has dripped into a sterile tube, the incision is compressed with sterile gauze, as the foot (or arm) is raised. At the moment when the pressure is removed, a half-width mercurochrome handy tape is wrapped around the toe (or finger) at the incision. The dressing is kept dry and not removed within two days. This method, suggested by Dr. Daughtry-Denmark, has been used for years. Infection has never occurred.

mixtures (plain and alum precipitated), various time intervals (one to four weeks) between the three doses, and various time intervals (six to twelve weeks) between the final dose and the immunity tests were used. An additional 1,507 infants were given injections at the Evanston Health Department Immunization Clinic and at St. Vincent's Infant and Maternity Hospital (Chicago). Of these, 648 were included in the tables.[5] All were more than 7 months of age when the injections were begun. The average age was about 8 months. Injections were made in alternate upper arms, starting with the left. To retard absorption, to produce a maximum response and to lessen systemic (febrile) reactions, the separate (simultaneous) injections and the mixed (plain) injections were given superficially (just under the skin), so that a lump was visible at the site of injection. It was found that the alum precipitated mixture caused less frequent fluctuating areas (sterile abscess) when each dose was injected more deeply under the skin of the upper arms, with the needle directed distally. Practically the only interruption in the regular administration of the injections occurred in infants who contracted intercurrent diseases or who moved away. Those who failed to complete the series of injections were not included in the final tabulations.

STANDARD DIPHTHERIA TOXOID AND PERTUSSIS VACCINE, SEPARATE (SIMULTANEOUS)

In this series 1, 1 and 1 cc. doses of standard diphtheria toxoid and 2, 2 and 3 cc. doses of pertussis vaccine (15,000 million bacilli per cubic centimeter) were injected separately (simultaneously), with a weekly interval between the doses at St. Vincent's Orphanage and a three week interval at the Health Department Clinic. To determine when the peak of the 3 plus or 4 plus complement fixation test was reached, follow-up pertussis complement fixation tests were performed at one, three, six and twelve weeks after the final dose.

TABLE 2.—*Immunity Responses After Diphtheria Toxoid and Pertussis Vaccine, Mixed*

Total dose: 7 cc. (2, 2 and 3 cc.) diphtheria toxoid and H. pertussis vaccine (15,000 million bacilli per cubic centimeter), mixed.

	Number Children Tested	Interval Between 3 Doses, Weeks	Negative Schick Test, per Cent	3+ or 4+ Pertussis Complement Fixation, per Cent
St. Vincent's Orphanage	33	1	91	66*
Evanston Health Department	79	3	97	72†

* The weekly interval was discontinued because pertussis immunity response was low.

† Three weeks after a "stimulating" dose of vaccine (2 cc. 15,000 million bacilli per cubic centimeter), 95 per cent of the infants with complement fixation less than 3+ became 3+ or 4+.

The three week intervals between the three doses, and the six week interval between the last dose and the immunity test gave the highest pertussis immunity response. At the follow-up tests, six weeks after the last dose, 91 per cent of the one week group and 97 per cent of the three week group were Schick negative; 69 per cent of the one week interval group, and 97 per cent of the three week group had 3 plus or 4 plus pertussis complement fixation. Seventy-one per cent of the one week interval group and all of the three week group who failed to show at least 3 plus complement fixation when tested six weeks after the last dose gave 3 plus or 4 plus positive tests when retested three weeks after a "stimulating" dose of pertussis vaccine (2 cc. of 15,000 million bacilli per cubic centimeter). None are known to have acquired either disease.

TABLE 3.—*Immunity Responses After Alum Precipitated Diphtheria Toxoid and Pertussis Vaccine, Mixed*

Total dose: 3 cc. (1, 1 and 1 cc.) diphtheria toxoid and H. pertussis (15,000 million bacilli per cubic centimeter), alum precipitated, mixed

	Number Children Tested	Interval Between 3 Doses, Weeks	Negative Schick Test, per Cent	3+ or 4+ Pertussis Complement Fixation, per Cent
St. Vincent's Orphanage	102	1	83	77*
Evanston Health Department	139	3	98	92*
Evanston Health Department	97	4	98	94

* Three weeks after a "stimulating" dose of vaccine (2 cc. 15,000 million bacilli per cubic centimeter), 100 per cent of the complement fixation tests less than 3+ became 3+ or 4+.

STANDARD DIPHTHERIA TOXOID AND PERTUSSIS VACCINE, MIXED[6]

In this series 2, 2 and 3 cc. of mixed antigens (0.5 cc. standard diphtheria toxoid and 15,000 million bacilli per cubic centimeter pertussis vaccine) were injected at one week intervals at St. Vincent's Orphanage and at three week intervals at the Health Department Clinic. The Schick test was negative in 91 per cent of infants injected at weekly intervals and in 97 per cent of the three week group. Three plus or 4 plus complement fixation occurred in 66 per cent of the one week interval group and in 72 per cent of the three week group. The weekly interval between the three doses was discontinued when the pertussis immunization response was found low. Ninety-five per cent of the infants of the three week group with complement fixation tests less than 3 plus became 3 plus or 4 plus when retested three weeks after the injection of a "stimulating" dose of pertussis vaccine (2 cc. of 15,000 million per cubic centimeter).

A total dose of 6 cc. (1, 2 and 3 cc.) of the mixed antigens was then injected into a group of infants at one month intervals. The pertussis immunization

5. Infants injected with mixtures of the two antigens but not tabulated were in subgroups, injected either with another concentration (20,000 million bacilli per cubic centimeter), at another time interval between the doses (two weeks) or with other doses. To determine whether doses of 1, 2 and 3 cc. of the mixtures caused an immunity response different from that after the same mixtures injected in doses of 2, 2 and 2 cc., Schick and pertussis complement fixation tests were performed on comparable groups.

6. The mixed antigens used in this investigation were prepared according to our detailed specifications, from 5 to 7 strains of H. pertussis recently isolated and standard diphtheria toxoid, by Parke, Davis & Co., Detroit. The bacilli were grown on Bordet-Gengou medium containing defibrinated human (not animal) blood. Fresh "packed" red cells, obtained from the plasma bank, were diluted with an equal volume of sterile isotonic solution of sodium chloride (0.85 per cent). The growth was scraped from the cultured medium, suspended in 0.85 per cent salt solution containing merthiolate 1: 5,000. After refrigeration at 5 to 10 C. for several weeks it was cultured for sterility and examined microscopically for absence of contaminants. Each lot was standardized to contain 30,000 million pertussis organisms per cubic centimeter. An equal volume of diphtheria toxoid was added to the suspension so that 1 cc. of the final concentration contained 0.5 cc. of standard diphtheria toxoid and 15,000 million pertussis organisms. The alum precipitated mixture contained 10,000 million bacilli per cubic centimeter. Recently a new concentration containing 30,000 million bacilli per cubic centimeter has been used. A dose required half the volume (0.5 cc.) and the local reactions were less severe.

response equaled that after the total dose of 7 cc. (2, 2 and 3 cc.) injected at three week intervals. A total dose of 6 cc. (containing a total of 3 cc. of standard toxoid and 90,000 million pertussis bacilli, i. e. 0.5 cc. standard diphtheria toxoid and 15,000 million bacilli per cubic centimeter), injected in 1, 2 and 3 cc. doses, at one month intervals, became the standard procedure when the plain mixture was used. No instance of severe systemic (febrile) or local reaction was reported. No infant in either group is known to have developed either disease.

ALUM PRECIPITATED DIPHTHERIA TOXOID AND PERTUSSIS VACCINE, MIXED

In this series 1, 1 and 1 cc. of alum precipitated mixed antigens (0.5 cc. of standard diphtheria toxoid and 10,000 million bacilli per cubic centimeter pertussis vaccine) were injected at one week intervals at St. Vincent's Orphanage and at three week intervals at the Health Department Clinic. The total dose of the pertussis vaccine was 30,000 million bacilli. Three plus or 4 plus pertussis complement fixation reactions occurred in a higher percentage of infants than when the plain mixture (total dose of 90,000 million bacilli) was used.

TABLE 4.—*The Effect of Time Interval on Immunity Responses*

Number Children Tested	Interval Between 3 Doses, Weeks	Total Dose	Negative Schick Test, per Cent	3+ or 4+ Pertussis Complement Fixation, per Cent
100	1	3 cc. separate diphtheria toxoid and 7 cc. H. pertussis vaccine (15,000 million bacilli per cubic centimeter)	91	69
98	3	3 cc. separate diphtheria toxoid and 7 cc. H. pertussis vaccine (15,000 million bacilli per cubic centimeter)	97	97
32	1	7 cc. mixed diphtheria toxoid and H. pertussis vaccine (15,000 million bacilli per cubic centimeter)	91	63
79	3	7 cc. mixed diphtheria toxoid and H. pertussis vaccine (15,000 million bacilli per cubic centimeter)	97	72
103	1	3 cc. alum precipitated diphtheria toxoid and H. pertussis vaccine (10,000 million bacilli per cubic centimeter)	83	77
139	3	3 cc. alum precipitated diphtheria toxoid and H. pertussis vaccine (10,000 million bacilli per cubic centimeter)	93	92
97	4	3 cc. alum precipitated diphtheria toxoid and H. pertussis vaccine (10,000 million bacilli per cubic centimeter)	93	94

The Schick test was negative in 83 per cent of the one week group and in 98 per cent of the three week and one month groups. Three plus or 4 plus complement fixation occurred in 77 per cent of the one week interval group, in 93 per cent of the three week interval group and in 94 per cent of the one month interval group.

All infants with complement fixation tests less than 3 plus became 3 plus or 4 plus when retested three weeks after a "stimulating" dose of pertussis vaccine (2 cc. of 15,000 million bacilli per cubic centimeter). No infant is known to have contracted either disease.

THE TIME INTERVAL FACTOR

Zoeller [7] found a higher immunity response when the three doses of diphtheria toxoid were injected at three week intervals than when three equivalent doses were injected at weekly intervals. To determine whether the immunity response for each component antigen was higher with the three week interval than with the one week interval between the three doses, the infants were injected at one week intervals at St. Vincent's and at three week intervals at the Evanston Health Department Clinic. The percentage of negative Schick tests and 3 plus and 4 plus complement fixation for the two groups were summarized (table 4). In each of the three series (the simultaneous, the plain mixed and the alum precipitated antigens) the three week intervals between the three doses yielded a higher percentage of negative Schick tests than when the doses were given at one week intervals. Likewise, in each of the three series the pertussis complement fixations were more frequently 3 plus or 4 plus when the doses were injected at three week or one month intervals than they were after the one week interval between the three doses.

COMMENT

Systemic (febrile) reactions were transient and usually mild: the rectal temperature occasionally reached 102 F., rarely rose higher and was down within thirty-six hours. Local reactions took place in a small number of instances with a fluctuating area at the site of injection (sterile abscess) after the alum precipitated mixture, especially when injected at weekly intervals. Approximately 2 per cent of the injections were followed by such a local reaction.[8]

Simon and Craster [9] were the first to report on the use of an alum precipitated mixture of the two antigens. They gave two injections of 1 cc. each, containing 10,000 million bacilli per cubic centimeter of "washed" (Kendrick-Eldering type) pertussis vaccine. Within eighteen months 4 of the 11 children known to have been exposed contracted whooping cough. They recommended four 1 cc. doses at monthly intervals. Since then Daughtry-Denmark [10] and Kendrick [11] have published reports on the use of alum precipitated mixtures of diphtheria toxoid and pertussis vaccine. In his book "Whooping Cough" Lapin [12] said "The whole subject of mixed immunizations obviously requires a long follow-up period to determine which method retains antigenicity for a long time. . . . My own experience with combined pertussis vaccine-diphtheria toxoid, alum precipitated, and with a combined pertussis vaccine-diphtheria and tetanus toxoid, alum precipitated, has been disturbing in that a large percentage

7. Zoeller, C.: Bacille diphtérique, in Natan-Larrier, L.: Traité de microbiologie, Paris, Gaston & Cie, 1934, vol. 2, p. 88.

8. In a recent discussion on the injection of alum precipitated antigens, J. P. Leake said (Vaccines and Serums: Indications and Procedure, J. A. M. A. **121:** 852 [March 13] 1943) "In using alum precipitate, put the needle parallel with the humerus, so that the injection is as deeply subcutaneous as possible. It remains there and sometimes becomes fluctuant. If some physician who doesn't understand these things sees it, it may be incised. It shouldn't be incised. They are not abscesses. They will go away, in general, with practically no attention at all." After using this technic fewer fluctuating areas occurred, but usually a subcutaneous nodule could be palpated for more than three weeks at the site of each alum injection.

9. Simon, H., and Craster, C.: Simultaneous Immunization with Combined Diphtheria-Whooping Cough Vaccine, J. M. Soc. New Jersey **38:** 461, 1941.

10. Daughtry-Denmark, L.: Whooping Cough Vaccine, Am. J. Dis. Child. **63:** 453 (March) 1942.

11. Kendrick, P.: Use of Alum Treated Pertussis Vaccine, and of Alum Precipitated Combined Pertussis Vaccine and Diphtheria Toxoid for Active Immunization, Am. J. Pub. Health **32:** 615, 1942.

12. Lapin, J.: Whooping Cough, Springfield, Ill., Charles C Thomas, Publisher, 1943, chapter 12, p. 77.

of severe reactions and alum abscesses were produced. Any public health measure must balance superior antigenicity against frequency and severity of reactions." The Committee on Therapeutic Procedures of the American Academy of Pediatrics [13] cautioned "More local reactions are apt to occur after combined vaccine injections, especially of the alum precipitated toxoids. There is a sharp sensation felt after the injection, and local redness comes on with pain. Nodulation is extremely common and abscesses may occur." Notwithstanding an occasional fluctuating area, many pediatricians prefer alum precipitated antigens because the volume of each dose is small. When standard diphtheria toxoid and pertussis vaccine, mixed, is used a "stimulating" dose of 2 cc. of pertussis vaccine (15,000 million bacilli per cubic centimeter) may be injected subsequently, preferably before the child enters school.

SUMMARY

1. After standard diphtheria toxoid and pertussis vaccine, mixed, 97 per cent of the infants, injected with three doses at three week intervals, had negative Schick tests; 72 per cent had 3 plus or 4 plus pertussis complement fixation.

2. After a "stimulating" dose of 2 cc. of pertussis vaccine (15,000 million bacilli per cubic centimeter) 95 per cent of the infants with less than 3 plus pertussis complement fixation after standard diphtheria toxoid and pertussis vaccine, mixed, developed 3 plus or 4 plus reaction.

3. After alum precipitated diphtheria toxoid and pertussis vaccine, mixed, 98 per cent of the infants injected with three doses at three week intervals had negative Schick tests; 92 per cent had 3 plus or 4 plus pertussis complement fixation.

4. A fluctuating area (sterile abscess) followed 2 per cent of the injections of alum precipitated diphtheria toxoid and pertussis vaccine, mixed.

5. No infant so injected during the past five years with either mixture (plain or alum precipitated) is known to have contracted either disease.

CONCLUSIONS

A comparison of the immunity responses (negative Schick tests and 3 plus or 4 plus pertussis complement fixation tests) after three doses of mixed diphtheria toxoid and pertussis vaccine (plain or alum precipitated) shows that infants can be immunized successfully against the two diseases at the same time.

Although the immunity responses are somewhat higher with the alum precipitated mixture, using one third of the total number of H. pertussis bacilli, the occurrence of a sterile abscess following 2 per cent of the injections makes the plain mixture the product of choice.

636 Church Street.

13. Toomey, J.; Hoyne, A.; Huenekens, E.; Reading, W.; Schick, B., and Thelander, H.: Report of the Committee on Therapeutic Procedures, American Academy of Pediatrics, November 1943, p. 17.

Water Balance.—Water is a vitally important factor in nutrition. Measured by the urgency of demand and the promptness with which disaster follows failure of supply, it is of greater importance than the ordinary foodstuffs and is second only to oxygen. It is the vehicle which transports to the cells the nutritive elements and carries away the waste products of metabolism; it furnishes the medium in which all intracellular chemical changes take place.—McLester, James S.: Nutrition and Diet in Health and Disease, Philadelphia, W. B. Saunders Company, 1943.

THE TREATMENT OF FILARIASIS (WUCHERERIA BANCROFTI)

WITH LITHIUM ANTIMONY THIOMALATE

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Filaria infections and elephantiasis have not been of especial concern to American physicians despite the widespread distribution of this condition throughout the world. Only at Charleston, S. C., the endemic focus of the United States, has the disease been an immediate problem. The global nature of the present war, however, has exposed our armed forces to diseases not commonly present in the United States, and recent reports [1] indicate that our armed services are exposed to filaria infection and that numbers are becoming infected. Since this infection may have an incubation period up to a year or more and since it may lie quiescent for years, not only military but civilian doctors as well may have to cope with it in this country in returning service men.

Numerous drugs have been tried in the treatment of early filarial infections. Occasionally the treatment has resulted in a temporary decrease in the number of microfilariae circulating in the blood stream but the adult worms were not killed and they continued to produce microfilariae. Operative procedures late in the disease, when elephantiasis is present, frequently leave much to be desired and constitute an admission of the failure of early treatment.

Several of the few drugs that have a temporary effect on filarial infections contain antimony. The one on which the present study is based is lithium antimony thiomalate (Anthiomaline). It has the following structural formula:

$$\left[\begin{array}{l} \mathrm{LiO.CO.CH-S} \\ \quad\quad\quad\quad | \\ \mathrm{LiO.CO.CH_2} \end{array}\right]_3 \mathrm{Sb.9\ H_2O}$$

It is supplied as a 6 per cent solution, 1 cc. containing 60 mg. of lithium antimony thiomalate or 10 mg. of antimony.

de Choisy [2] treated a patient who exhibited clinical manifestations of a Loa loa infection with lithium antimony thiomalate and reported improvement in his condition. Apparently no microfilaria counts were made on the patient's blood during or after treatment. A total of 35 cc. of lithium antimony thiomalate was given intramuscularly to this patient over a period of twenty-three days. Poynton [3] injected lithium antimony thiomalate directly into enlarged lymph glands of patients harboring Wuchereria bancrofti or Wuchereria malayi. The attacks of fever were reported reduced

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1. Burhans, R. A.; Camp, J. D.; Butt, H. R., and Cragg, R. W.: Lymphangitis of Suspected Filarial Origin, U. S. Nav. M. Bull. **42**: 336-340, 1944. Rome, H. P., and Fogel, R. H.: The Psychosomatic Manifestations of Filariasis, J. A. M. A. **123**: 944-946 (Dec. 11) 1943.

2. de Choisy, H.: Observation d'un cas de microfilariose loa traité par l'antimonio-thiomalate de lithium, Rev. de méd. et d'hyg. trop. **29**: 294-296, 1937.

3. Poynton, J. O.: Filariasis, in Annual Report of the Institute for Medical Research of the Federated Malay States, Kuala Lumpur, 1938, pp. 80-85.

in number and intensity in these patients. Chopra and Rao [4] treated 7 filaria patients with lithium antimony thiomalate. They gave two intramuscular injections weekly, using up to a total of 30 cc. per patient. Only a temporary slight reduction in microfilariae was noted. Hawking [5] likewise failed to secure a permanent microfilaria reduction in 10 W. bancrofti infected patients with lithium antimony thiomalate given intramuscularly. The total dosage employed by him varied from 7 cc. to 25 cc., which was given over a period of from twelve to forty-nine days.

Studies in the past four years by Brown, Brooks and Waletzky [6] indicate that lithium antimony thiomalate is effective in the treatment of dogs infected with the filarid worm Dirofilaria immitis. Although the adult Dirofilaria lives free in the right cavity of the dog's heart and Wuchereria bancrofti of man lives in the lymphatic system, it was considered worth while to try lithium antimony thiomalate in human infections. Our dog studies suggested that somewhat larger total doses than had been tried by other workers might be needed to be effective in human infections. It is quite conceivable, however, that a drug which reaches sufficient concentrations in dog's blood to kill worms therein may not reach sufficiently high concentrations in the human lymph system to be lethal to worms harbored there.

Lithium antimony thiomalate has been used with some success in the treatment of lymphogranuloma venereum,[7] trypanosomiasis,[8] schistosomiasis [9] and leishmaniasis,[10] and the tolerated dosage has been approximately ascertained and toxicity for man studied.[11]

Animal toxicity studies have been made by Launoy,[12] Laurens,[13] Launoy and Lagodsky [14] and myself (unpublished data). Additional toxicologic studies are also in progress in several laboratories.

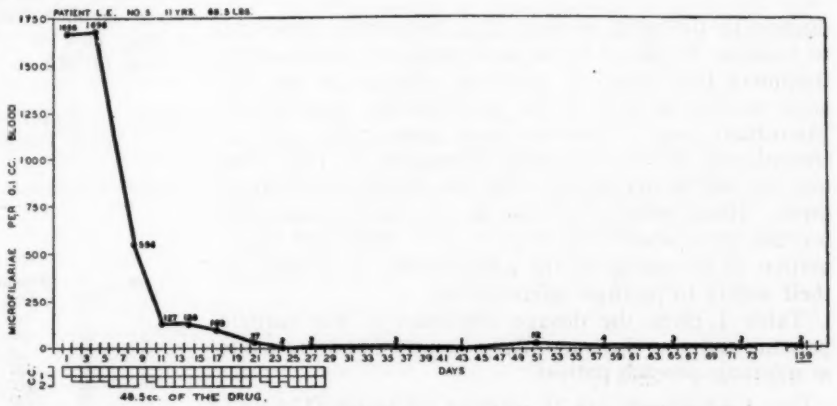

Chart 1.—Effect of intramuscular injections of lithium antimony thiomalate on the microfilaria count.

METHODS

The 12 filaria patients treated during the summer of 1943 with lithium antimony thiomalate were all natives of St. Croix, Virgin Islands. They were already in the hospital for some other cause or were persons found to be microfilaria positive in a survey. Except for 1 patient who had greatly enlarged inguinal and femoral lymph glands and another with enlarged glands and scrotum, the only evidence of filaria infections of the remainder of the patients was microfilariae in the blood and a slight but definite general glandular enlargement with a history of recurrent lymphangitis. The patients were all given a complete physical examination prior to treatment in order to measure any later changes ascribable to the filaria infection or treatment. Blood counts and urine examinations were made before, during and after treatment.

A number of the patients remained in the hospital during the course of treatments, while others came in daily for their injection of lithium antimony thiomalate and continued their usual work and activity.

All injections of lithium antimony thiomalate were given into the gluteal muscles, alternating sides daily unless the patient complained of soreness on one side and asked for repeated injections into the other side. Usually a single daily injection was given on consecutive days unless prevented by poor cooperation of the patient or toxic manifestations of the drug. The adult dose of 3 cc. (180 mg.) was used, with adjusted smaller doses for children. On the first day of treatment a half-sized dose was given to ascertain sensitivity of the patients to the drug. In order to keep the drug level as constant as possible with a single daily dose the injections were given at regular twenty-four hour intervals.

The results of the therapy were measured by microfilaria counts on 0.1 cc. of blood after the method of Brown and Sheldon.[15] Since the microfilariae exhibit a nocturnal periodicity, all specimens of blood were drawn from the cubital vein from 10 to 10:30 p. m.

Microfilaria counts on the blood of control persons not treated remained relatively constant during the six months that the treated patients were under observation.

RESULTS

The results of treatment are based almost entirely on microfilaria counts. In assaying the results it is

4. Chopra, R. N., and Rao, S. S.: Chemotherapy of Filarial Infection, Indian J. M. Research **27**: 549-562, 1939.

5. Hawking, F.: Chemotherapy of Filariasis in Vivo and in Vitro, J. Trop. Med. **43**: 204-207, 1940.

6. Brown, H. W.; Brooks, T. J., and Waletzky, E.: The Treatment of Canine Heartworm (Dirofilaria Immitis) with Anthiomaline, paper read at meeting of American Society of Tropical Medicine, November 1943.

7. Shaffer B.: Anthiomaline: A Further Evaluation of Its Effect in Lymphogranuloma Venereum, Am. J. Syph., Gonor. & Ven. Dis. **26**: 489-493, 1942. Stammers, F. A. R., and Law, W. A.: Tropical Bubo or Lymphogranuloma Inguinale, J. Roy. Army M. Corps **79**: 300-305, 1942. Sézary, A., and Facquet, J.: Traitement de la maladie de Nicolas-Favre par un sel d'antimoine trivalent, injectable dans les muscles, Bull. Soc. franç. de dermat. et syph. **41**: 771-774, 1934.

8. Bertrand, Y.: Essais du mélange anthiomaline-moranyl dans le traitement de la trypanosomiase humaine, Bull. Soc. path. exct. **31**: 522-532, 1938. Rousseau, G.: Quelques essais de traitment de trypanosés chroniques par le mélange anthiomaline-moranyl, Ann. Soc. belge de méd. trop. **19**: 73-80, 1939.

9. Gobert, E.: Traitement de la bilharziose par l'antimonio-thiomalate de lithium (anthiomaline) à Gafsa, Bull. Soc. path. exot. **30**: 393-398, 1937. Farges: Essais et resultats de diverses posologies dans le traitement des bilharzioses par l'anthiomaline, Ann. de méd. et de pharm. colon. **35**: 196-210, 1937. Moulinard.[16]

10. Villain, G.; Marini, C., and Belfort, J.: Leishmaniose cutanée, Tunisie méd. **30**: 244-247, 1936. Senekji, H. A.: A Comparison of the Efficiency of Certain Drugs and Dyes in Killing Cultures of Leishmania Tropica, J. Path. & Bact. **50**: 171-176, 1940. Grenier-boley.[17]

11. For a review of the literature on lithium antimony thiomalate see "A Summary of Current Literature on Anthiomaline," Office of Medical Information, National Research Council, 1943.

12. Launoy, L.: Action de la cystéine sur la toxicité de l'antimoine, Compt. rend. Acad. d. sc. **199**: 646-648, 1934.

(Footnotes continued in next column)

13. Laurens, M.: Le traitement de la maladie de Nicolas et Favre par l'antiomoine III thiomalate de lithium (anthiomaline), Thesis, Paris, 1935.

14. Launoy, L., and Lagodsky, H.: L'hémoglobine et les hématies du sang de lapin au cours de l'injection intraveineuse répétée de deux composés organiques d'antimoine, Bull. Soc. path. exot. **31**: 68-76, 1938.

15. Brown, H. W., and Sheldon, A. J.: Treatment of Canine Heartworm (Dirofilaria Immitis) with Fuadin and Sulfanilamide, J. Am. Vet. M. A. **98**: 477-481, 1941.

evident that a drug used in the treatment of filariasis may kill the microfilariae in the blood stream and not be fatal to the adult worms in the lymph system. In such an event microfilariae would disappear temporarily from the blood stream but again appear in the blood after treatment is discontinued, owing to reproduction by the adult worms. It is necessary, therefore, to examine the blood for several weeks or months after treatment has ceased to ascertain whether or not the adult worms, as well as the microfilariae, were killed. Microfilaria counts have now been made on the patients treated with lithium antimony thiomalate for from four and one-half to five months after the completion of treatment. Blood smears will also be examined at intervals for the next several months to give additional information of the status of the adult worms as judged by their ability to produce microfilariae.

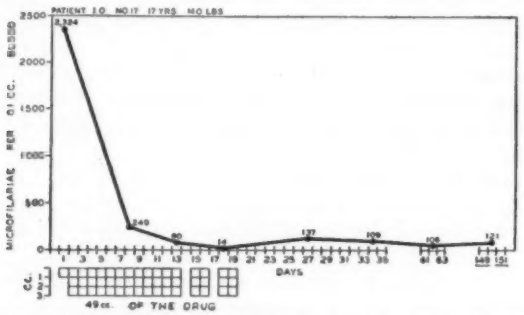

Chart 2.—Effect of intramuscular injections of lithium antimony thiomalate on the microfilaria count.

Table 1 gives the dosage schedules of the various patients and also the microfilaria counts that were made at intervals on each patient.

Case 1.—A woman aged 23, weighing 118 pounds (53.5 Kg.), exhibited slight general glandular enlargement. She was given 3 cc. of lithium antimony thiomalate on alternate days as suggested by workers using the drug in the treatment of lymphogranuloma venereum. She was given a total of 19.7 cc. (1.18 Gm.). No reduction was obtained in her microfilaria count by the completion of her treatment, but two months after treatment her microfilaria count had fallen from 86 to 47. Five months after the completion of treatment her count was 14. This patient had been delivered of a baby ten days before treatment with lithium antimony thiomalate was instituted. Microfilaria reduction was 89.3 per cent.

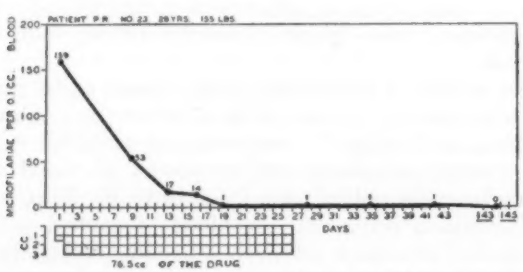

Chart 3.—Effect of intramuscular injections of lithium antimony thiomalate on the microfilaria count.

Case 3.—A boy aged 14 years, weighing 85½ pounds (39 Kg.), exhibited slight general glandular enlargement. The microfilaria count was 455. He was given 1 cc. of lithium antimony thiomalate on the first day of treatment to test possible sensitivity to the drug. It was planned to give him 2 cc. daily. Approximately fifteen hours after the first injection he complained of pain in the right lower quadrant and experienced some difficulty in breathing. His pulse rate at this time was 128 and respiratory rate was 40 and temperature 100 F. Numerous rales and squeaks could be heard in his chest. His breathing was eased by 0.5 cc. of epinephrine. His temperature rose to 101.6 F. On the following day the patient was again quite normal. He gave then a history of having what had been diagnosed as asthmatic attacks. Whether or not the attack was precipitated by the injection of lithium antimony thiomalate is unknown. Continued treatment was considered unwarranted at this time, however.

Case 4.—A man aged 70, weighing 126 pounds (57 Kg.), had had enlarged inguinal lymph glands, the one on the left side the size of a hen's egg, and scrotum about three times normal size, since childhood. A daily dose of 3 cc. (180 mg.) of lithium antimony thiomalate was given (total 43.5 cc.). The pretreatment microfilaria count of 208 continued to drop and was 6 five months after the completion of treatment. The scrotal enlargement and greatly enlarged inguinal and femoral lymph glands did not appear to be affected by the treatment. On the 17th day of treatment the patient's temperature rose to 103 F. and he vomited a small quantity of clear yellow fluid. As the patient was hypertensive, treatment was discontinued. He experienced rises in temperature to 101 and 100 F. respectively on the two following days, with a subsequent return to normal. The microfilaria reduction was 97.1 per cent.

Case 5.—A boy aged 11 years, weighing 68 pounds (31 Kg.), whose inguinal lymph nodes were slightly enlarged, was given a daily dose of lithium antimony thiomalate 1.5 or 2 cc. to a total of 48.5 cc. (2.91 Gm.). The pretreatment microfilaria count of 1,666 fell to 3 by the completion of treatment of twenty-seven injections. Four and one-half months after cessation of treatment the patient's microfilaria count was 3.

Table 1.—*Effect of Intramuscular Injection of Lithium Antimony Thiomalate (Anthiomaline) on Wuchereria Bancrofti Infections*

Case No.	Age	Weight, Lbs.	Treatment Period, Days	Total Cc. of Drug	Microfilaria Count, 0.1 Cc. Blood: Before Treatment	After Treatment	4-5 Mos. After Treatment	Per Cent Reduction
1	23	118	13	19.7	86	109	14	89.3
4	70	126	17	43.5	208	21	6	97.1
5	11	68	28	48.5	1,666	3	3	99.9
9	19	132	20	55.5	12	42	12	0
10	28	124	12	27	0	0	0	....
17	17	140	19	49	2,324	14	72	96.9
18	16	86	18	35.5	1,100	25	159	85.5
21	11	76	18	32	756	18	0	100
22	21	96	7	15	129	8	1	99.3
23	28	155	26	76.5	159	1	0	100
24	16	110	16	29.5	236	68	33*	86
25	31	125	17	42.5	234	58	34	85.5

* Seven months after treatment.

This patient had a daily rise of temperature to 99.5-100.2 F. on each of the seven last days of treatment. He vomited on the 8th day of treatment, and no drug was given the following day. Although he occasionally complained of a slight pain in his umbilical region, he did not vomit again although treatment was continued. The microfilaria reduction was 99.9 per cent.

Case 9.—A youth aged 19, whose weight was 132 pounds (60 Kg.), presented slight general glandular enlargement. He was given a total of 55.5 cc. of lithium antimony thiomalate over a period of twenty days. By the completion of treatment his microfilaria count had risen to 42 from a pretreatment count of 12. Four months after the completion of treatment the microfilaria count was 12. The microfilaria reduction was 0 per cent.

Case 10.—A man aged 28, weighing 124 pounds (56 Kg.), did not have microfilaria in his blood during the present study although hospital records indicate that they were present in 1941. In 1938 greatly enlarged right inguinal and femoral lymph glands were removed, and in 1941 those on the left side were removed. Lymph glands in these areas soon enlarged again and masses of them approximately 1 by 3 inches were present when treatment with lithium antimony thiomalate was begun. The patient complained that physical exercise resulted in considerable pain in the inguinal region. He was given 27 cc. (1.62 Gm.) of lithium antimony thiomalate over a period of twelve

days, treatment being somewhat irregular the last five days because of gastric distress and vomiting. The patient noted no improvement in inguinal pain on exercise during treatment. Five months later, however, he reported that the inguinal pain on exercise had greatly diminished and in fact had practically disappeared. There was no detectable change in the size of the inguinal and femoral lymph glands at this time.

CASE 17.—A youth aged 17 years, weighing 140 pounds (63.5 Kg.), presented slight glandular enlargement, especially in the inguinal region. This patient had the highest microfilaria count of the group, 2,324 to 0.1 cc. It is estimated that all of the patient's microfilariae if placed end to end would have stretched 11 miles, and their total volume was calculated as 48 cubic inches. He was given 3 cc. of lithium antimony thiomalate daily to a total of 49 cc. (2.94 Gm.). The patient's microfilaria count fell to 14 by the completion of treatment but rose to 137 ten days later. Four and one-half months after the completion of treatment his microfilaria count was 72. The microfilaria reduction was 96.9 per cent.

CASE 18.—A girl aged 16 years, weighing 86 pounds (39 Kg.), showed slight general glandular enlargement, especially noticeable in the epitrochlear regions. She was given a total of 35.5 cc. (2.13 Gm.) of lithium antimony thiomalate over a period of eighteen days. Her pretreatment microfilaria count of 1,100 fell to 25 by the end of treatment. Two weeks later the count had risen to 184, and four and one-half months after treatment it was 159. The patient vomited on the 13th, 15th and 16th days of treatment, so the dosage of the drug was decreased during this period and omitted on one day. The microfilaria reduction was 85.5 per cent.

CASE 21.—A girl aged 11 years, weighing 76 pounds (34.5 Kg.), showed slight general glandular enlargement, especially of the epitrochlear and inguinal lymph glands. She was given 2 cc. of lithium antimony thiomalate daily to a total dose of 32.0 cc. (1.92 Gm.). Her pretreatment microfilaria count dropped from 756 to 18 by the completion of treatment. During the next four and one-half months it gradually fell and became negative at the end of this time—a microfilaria reduction of 100 per cent.

CASE 22.—A woman aged 21, weighing 96 pounds (43.5 Kg.), showed slight general glandular enlargement, especially of the epitrochlear and inguinal lymph nodes. She was given a total of 15 cc. of lithium antimony thiomalate (0.9 Gm.) in seven days. Nine days after the last injection her count had fallen from 129 to 8 and four and one-half months later to 1, a microfilaria reduction of 99.3 per cent.

CASE 23.—A man aged 28, weighing 155 pounds (70 Kg.), showed general glandular enlargement, especially of the epitrochlear and inguinal lymph glands. This patient received the largest total amount of lithium antimony thiomalate, 76.5 cc. (4.59 Gm.) in daily consecutive doses over twenty-six days. He experienced no inconvenience from the treatment. His pretreatment microfilaria count of 159 fell to 1 by the 19th day of treatment. This microfilaria count of 1 persisted for two weeks after completion of treatment but fell to zero five months after treatment, a microfilaria reduction of 100 per cent.

CASE 24.—A boy aged 16 years, weighing 110 pounds (50 Kg.), showed general glandular enlargement. The epitrochlear and inguinal lymph glands were moderately enlarged. He was given a total of 29.5 cc. (1.77 Gm.) of lithium antimony thiomalate over a period of sixteen days. Late in the treatment it was impossible to maintain the daily dose of 2.5 cc. because of persistent vomiting. The patient's preliminary microfilaria count of 236 fell to 42 on the 9th day of treatment. In spite of continued, although irregular, treatment his microfilaria count rose and by two weeks after cessation of treatment was 134. From this point on the count fell to 33 on the 210th post-treatment day.

CASE 25.—A man aged 31, weighing 125 pounds (57 Kg.), showed slight general glandular enlargement, especially noticeable in the epitrochlear and inguinal regions. He was given daily injections of 3 cc. of lithium antimony thiomalate for ten days after the preliminary 1.5 cc. dose. By the end of this eleven day treatment period his microfilaria count had dropped from 234 to 26. During the subsequent six days, however, treatment was omitted twice and decreased on one day because of vomiting and joint pains in the shoulder and elbow. He was treated therefore over a period of seventeen days, receiving a total of 42.5 cc. (2.55 Gm.). A week after the completion of treatment his microfilaria count had risen to 124. This count fell to 34 during the next four and one-half months, a microfilaria reduction of 85.5 per cent.

TOXICITY OF LITHIUM ANTIMONY THIOMALATE TO PATIENTS

Vomiting.—The most frequent toxic reaction, experienced by 40 per cent of the patients, was vomiting accompanied by epigastric pain. Vomiting occurred only after repeated injections, totaling from 0.780 to 1.89 Gm. of lithium antimony thiomalate. Vomiting occurred most frequently two to three hours after the injection, although it was sometimes delayed ten to twelve hours. In several instances the vomiting ceased although treatment was continued; usually, however, once vomiting began it continued as long as the full dose of the drug was continued. Pain in the epigastric region was complained of by the patients both before and after vomiting, and pain on pressure was noted in this area. To stop the vomiting the dose of the drug was reduced or treatment omitted entirely for one day. Ashkar [16] and others have likewise reported vomiting after a total of 1.20 Gm. or more had been reached. Gobert [9] suggests a two hour rest after antimony treatment to reduce vomiting. In the series reported here, however, vomiting occurred among those patients who were hospitalized as well as those who were treated in the outpatient department.

Local Reaction at the Site of Injection.—Gluteal reaction at the site of injection of lithium antimony thiomalate varied greatly from patient to patient. The majority of them experienced no inconvenience. Occasionally a patient would complain of soreness and ask for the next several injections to be given in the opposite side. One woman taking her injections in the outpatient department stopped treatment after seven injections totaling 0.9 Gm. of the drug, complaining of sore buttocks. Examination failed to reveal evidence of inflammation sufficient to warrant discontinuing treatment. Sites of former drug injections frequently could be palpated as firm intramuscular painless masses. There was no evidence of severe inflammation or abscess formation, and in general the reaction at the site of injection was of little moment. Grenierboley [17] and Moulinard [18] stress the local and general tolerance to intramuscular injections of lithium antimony thiomalate, while Chopra and Rao [4] report that it caused severe reaction with pain and swelling at the site of injection. The latter were using doses up to 5 cc., which may explain the severe reactions. The maximum dose used in the series reported here was 3 cc.

Fever.—Two patients experienced fever near the end of their series of treatment. One patient's temperature rose suddenly to 103 F. after 2.61 Gm. of lithium antimony thiomalate and fell to normal over a period of three days when the drug was discontinued. The other patient had a low grade fever of 99.5 to 100.2 F. during the last seven days of treatment. Sézary and

16. Ashkar, M. F.: Treatment of Schistosomiasis with Anthiomaline (a Preliminary Report), J. Egyptian M. A. **21:** 614-619, 1938.
17. Grenierboley, J.: Sur le traitement de la maladie de Nicolas et Favre par un dérivé soufré de l'antiomoine, l'anthiomaline, Bull. Soc. méd.-chir. de l'Indochine **13:** 831-839, 1935.
18. Moulinard, M.: Traitement de la bilharziose par l'anthiomaline; resultats comparés à ceux obtenus avec l'émetine et l'émetique, Ann. de méd. et de pharm. colon. **34:** 352-371, 1936.

Bolgert [19] and others have likewise noted fever, usually during the last days of a series of injections.

Arthritis.—Although other workers [20] report localized pains of arthritic character as the most frequent toxic reaction of lithium antimony thiomalate therapy, it was experienced by only 1 of the patients in this series. After 1.71 Gm. of drug 1 patient (25), weighing 125 pounds (57 Kg.), noticed pain in his right shoulder area. Treatment was continued, and on the following day pain was noted also in his left shoulder. As the treatment continued the pain extended down the flexor surfaces of his arms to his elbows and became so severe that he moved his arms only with great pain. Treatment was suspended for a day with decided improvement of his arms and shoulder. The pain seemed to be localized in the joints, in the tendinous insertions and even in the muscles. The areas of the joint were very sensitive to pressure. There was no alteration in reflexes or edema.

Urine.—Intravenous phenolsulfonphthalein tests were done on the patients to ascertain kidney function before treatment. Only 1 patient (25) exhibited an excretion rate below the so-called normal. This patient's fifteen minute excretion was 8 per cent and one hour excretion 30 per cent. The patient tolerated the early portion of the treatment very well, but late in the treatment series he experienced the only arthritic disturbance encountered and also vomited.

TABLE 2.—*Blood Picture Before and After Treatment with Lithium Antimony Thiomalate*

Patient	Red Blood Cells	Hemoglobin	White Blood Cells
Before Treatment			
4	2,880,000	62%	9,000
5	3,500,000	70%	7,600
18	3,480,000	68%	7,300
21	3,410,000	70%	6,600
Four Weeks After Treatment			
4	2,900,000	65%	8,900
5	3,650,000	70%	8,400
18	3,000,000	68%	8,800
21	2,440,000	60%	6,200
Four to Five Months After Treatment			
4	3,400,000	70%	6,600
5	3,630,000	72%	9,200
18	2,980,000	65%	8,400
21	3,420,000	70%	7,000

Examinations of the various patients' urine (sugar, albumin, reaction, casts and blood cells) were made at intervals during treatment and there was no evidence of renal damage. Patient 5 had a trace of albumin in the urine before starting treatment. A trace of albumin was found in the urine on the 10th day of treatment after a total of 24.5 cc. of lithium antimony thiomalate had been administered. The urine was free from albumin thereafter. Patient 23 showed a trace of albumin in the urine after 37.5 cc. of lithium antimony thiomalate, but another specimen examined six hours later was albumin free. On the 20th day of treatment after 58.5 cc. of the drug he also had a trace of albumin in the urine.

Rashes.—Six of 12 patients experienced transitory itching rashes after a number of injections of the drug. In 3 instances the rash was on the lateral aspects of the fingers and thumbs and consisted of small raised papules 1 to 2 mm. in diameter. One patient had a similar rash on his face, especially his forehead, as well as his hands. Another patient had a punctate red rash on the chest and the flexor surfaces of his arms, and 1 patient had a similar rash on his chest and abdomen only. The rashes were not severe and usually remained static or disappeared even though treatment was continued. There is some question as to the exact etiology of the rashes and the relation of the lithium antimony thiomalate to them.

Blood.—Sézary and Bolgert [19] believe that prolonged administration of lithium antimony thiomalate seemed to cause a certain degree of anemia. On the other hand, Ashkar [16] observed no change in the blood picture "except for the eosinophilia that usually occurs with the other antimony compounds." Brooks,[21] using dogs, followed the blood picture after an intravenous injection of 4 cc. of anthiomaline with the following results:

> In both dogs used for this study there was a decrease of more than 50 per cent in the total white blood cell count within fifteen minutes after the drug was administered. Following this there was a rapid rise to 17,000 in 1 dog and 19,000 in the other. This maximum degree of leukocytosis was reached in approximately twelve hours in both cases. Over a period of ninety-six hours the total counts gradually decreased again to what was considered normal for these individual dogs. The red blood cell counts showed a brief rise following the injection of anthiomaline, after which there was a gradual decrease up to twenty hours. By the end of ninety-six hours the counts were again normal.

Launoy and Lagodsky,[14] using lithium antimony thiomalate in rabbits intravenously, conclude that four to five injections over twenty-four to thirty-five days produced only a slight transient anemia.

The blood of 4 patients in the series reported here was examined before treatment and four weeks and four to five months after treatment (table 2). The red blood cell count of patient 18 was approximately 500,000 cells lower four weeks and four months after treatment, although her hemoglobin remained unchanged. Patient 21 had a drop of approximately 1,000,000 red cells four weeks after treatment but returned to the pretreatment level by four months after treatment. The variations in white blood cell counts were probably all within normal limits.

It has been suggested by O'Connor [22] that the pathologic changes in filaria infected persons result from the host reaction to the dead adult worms. The results of any therapy that has as its purpose the killing of the adult worms and microfilariae should therefore be followed for a considerable period to ascertain the patient's reaction to the death of both the adult worms if this occurs and the death of the microfilariae if their decrease in number is due to lethal action of the drug rather than to a normal rate of death which is not followed by normal reproduction by adults. It is planned to follow the patients treated with lithium antimony thiomalate for several years to ascertain whether or not the death of their parasites affected them adversely.

Four and one-half to five months after the completion of treatment the patients were given a physical reexamination, and a medical history was taken of this period. None of the patients gave any evidence of a reaction attributable to death of either adult worms

19. Sézary, A., and Bolgert, M.: La posologie de l'anthiomaline, Bull. et mém. Soc. méd. d. hôp. de Paris **51**: 555-559, 1935.

20. Sézary, A.; Bolgert, M., and Joseph, R.: Le traitement de la maladie de Nicolas-Favre par l'anthiomaline (antimoine trivalent), Bull. Soc. franç. de dermat. et syph. **42**: 637-641, 1935. Sézary and Bolgert.[19]

21. Brooks, T. J., Jr.: The Treatment of Canine Filariasis with Anthiomaline, Thesis, University of North Carolina, 1942.

22. O'Connor, F. W.: The Etiology of the Disease Syndrome in Wuchereria Bancrofti Infections, Tr. Roy. Soc. Trop. Med. & Hyg. **26**: 13-47, 1932.

or microfilariae. There were no changes in the size of their glands and no evidence of inflammation or edema. Likewise none of the patients gave a history of inflammation, enlargement of glands or edema during the four to five months following treatment. If it is true that dead worms cause the pathologic changes, the large numbers of microfilariae (23,240 per cubic centimeter in patient 17) and adult worms should in time result in inflammatory reactions. On the other hand, tremendous numbers of microfilariae must die every day and be taken care of by the host in the average untreated case of filariasis, for if the length of life of a microfilaria is sixty to seventy days,[23] then one sixtieth to one seventieth must die each day and be replaced. Patient 17 had an estimated 100,000,000 microfilariae in his blood stream; hence approximately 1½ million would die each day. This continued destruction of microfilariae by the host may partially desensitize him to the foreign protein of the worms.

The patient's blood will also be followed at intervals for several years after treatment. If their blood stream remains free from microfilariae for months it is strong evidence that the adult worms are dead and were killed by the lithium antimony thiomalate. On the other hand, if microfilariae begin to appear twelve to fifteen months after treatment it is possible that reinfection has taken place since treatment, for this is approximately the length of time for a new infection to produce microfilariae.

COMMENT

The results of treatment with lithium antimony thiomalate of Wuchereria bancrofti infected persons strongly suggests that the drug is lethal not only to the microfilariae but also to the adult worms as well and that from 85 to 100 per cent of the worms are killed by one series of the drug. It is possible, of course, that the microfilariae circulating in the blood are more delicate than the adults and are more readily killed. Likewise a higher concentration of the drug may reach the microfilariae in the blood stream than reaches the adults in the lymphatics. Experience indicates that a drug may kill the microfilariae and temporarily sterilize the adult female so that the production of microfilariae is temporarily inhibited. It is essential, therefore, that the patient's blood be repeatedly examined for microfilariae over a considerable period after the completion of the treatment. The patients treated with lithium antimony thiomalate have been examined for microfilariae for from four and one-half to five months after the completion of treatment to determine the effect of the drug on the adult worms. It is considered unlikely that the adult worms that were injured to the extent that they did not produce microfilariae after four and one-half to five months are still alive.

Treatment with lithium antimony thiomalate usually resulted in decided reduction in microfilaria counts after a total of 15 to 20 cc. of the drug. Although treatment was continued there was an additional though slower reduction in microfilaria count. This suggests that the microfilariae may vary in susceptibility to lithium antimony thiomalate and that the resistant ones were killed only after a longer exposure to the drug. It may also mean that the adult worms differ in the rapidity with which they were killed owing either to individual variation in resistance or to their localization in the host. The initial sudden drop in microfilariae then may have been due to their elimination from the blood stream by the direct action of the drug. The adults, presumably more resistant to the effects of the drug and more slowly killed, continued to supply the blood stream with fewer and fewer microfilariae.

The continued persistence of microfilariae in the blood four to five months after treatment suggests that adult worms are still present, possibly protected in a fibrosed lymph gland from lethal concentrations of the drug. Our present knowledge indicates that microfilariae persist in the blood approximately ten weeks. It is doubtful, therefore, if the continued persistence of microfilariae could have been possible for five months without the presence of the adults.

The daily dosage of lithium antimony thiomalate per kilogram weight of the patient varied from 0.00155 Gm. to 0.00313 Gm. Likewise the total drug administered varied from 0.0217 Gm. to 0.0831 Gm. per kilogram weight of patient. It is impossible, however, in such a small series to correlate the drug dosage with effectiveness of treatment. It is known from the work of Chopra that there is great individual variation in the excretion rate of antimony by man. Hence given the same dosage, patients may vary in the actual antimony blood levels attained. Until a satisfactory method for the determination of antimony blood levels is available, the size and rate of lithium antimony thiomalate injections will be more or less empirical. Presumably the best therapeutic regimen would be one that maintained a high blood and tissue antimony concentration. This is predicated on the basis that antimony is the active element of the drug. On the other hand, there may be considerable variation in therapeutic effect between cases even though the blood antimony is the same, for there may be a decided difference in the location of the adult worms and the penetrability of their environment by the drug.

The lack of severe acute and chronic toxicity of lithium antimony thiomalate for man suggests, at least from present data, that continued carefully supervised therapeutic trial of this drug in filariasis is warranted.

It is recognized that lithium antimony thiomalate is not the ideal drug for the treatment of filariasis, as it does not kill all of the worms of all the patients and because of its toxicity for man. On the other hand, it may be possible to improve on its effectiveness by adjusting the size of doses and by giving several series of treatments. This problem is under study. On the other hand, if lithium antimony thiomalate is not used, no other therapeutic agent is available that offers any promise of cure.

The treatment of filariasis after the patient becomes microfilaria positive may be analogous to the treatment of syphilis after the patient exhibits a positive serologic reaction. In syphilis it is much more satisfactory to start treatment earlier on the basis of a positive dark field examination. Likewise in filariasis during the year or two between infection and becoming microfilaria positive the host reaction about the worm and growth of the worm may make it much more difficult to eliminate the infection. It might be highly advantageous therefore to treat a filaria infection as early as a diagnosis can be made. A clinical[24] and serologic[25] diagno-

23. Rao, S. S.: Filariasis Enquiry, in Report of the Scientific Advisory Board of the Indian Research Fund Association, 1933-1934, p. 85.

24. Buxton, P. A., and Hopkins, G. H. E.: Researches in Polynesia and Melanesia, Memoir Series no. 2, London, London School of Hygiene and Tropical Medicine, 1927. Dickson, J. G.; Huntington, R. W., Jr., and Eichold, S.: Filariasis in Defense Force, Samoan Group, U. S. Nav. M. Bull. **41**: 1240-1251, 1943. Fairley.[25]

25. Fairley, N. H.: Skin Test and Complement Fixation Reactions in Filariasis, Tr. Roy. Soc. Trop. Med. & Hyg. **25**: 220, 1931.

sis of filariasis sometimes may be made within three to five months after infection, i. e. one to two years before microfilariae appear in the blood, and it is suggested that a cure of these early cases may be successful, as the worm is immature, smaller and presumably not as robust as the full grown adult. Likewise tissue reactions about the young worm may be at a minimum and permit access of the drug to them in higher concentrations. A group of these early clinical cases that are microfilaria negative are now under treatment and will be reported later.

SUMMARY

1. Lithium antimony thiomalate, a compound given intramuscularly to a series of filaria infected patients, reduced their microfilaria count 85 to 100 per cent. This reduction was maintained for four to five months after the completion of treatment and means presumably that a corresponding number of the adult worms were killed. One patient failed to respond to treatment, and there was no reduction in his microfilaria count.

2. No reduction in size of enlarged lymph glands or one enlarged scrotum could be detected four to five months after the completion of treatment. One patient noted a pronounced improvement in his inguinal distress on exercise following treatment.

3. The patients' history and physical examination failed to reveal any pathologic changes due to the death of the adult worms or microfilariae.

4. The toxic manifestations due to lithium antimony thiomalate of vomiting, joint pain, slight fever and rash are not considered sufficient to preclude its continued trial in filariasis.

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COMPLICATIONS FOLLOWING ARTERIOGRAPHY OF PERIPHERAL VESSELS

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Arteriography of nearly all the main arteries of the body, including the carotid, pulmonary and abdominal aorta, has been successfully performed. The latter vessels require special technics, but the procedure for those of the extremities, though exacting, is fairly simple. The study permits accurate visualization of the direction of the course of the arteries, the width of the lumen and the shape of the inner wall. Thus arteriography demonstrates the degree and level of arterial obstruction in the severe tissue nutritional disturbances of arteriosclerotic occlusion, embolism, Buerger's disease and large vessel trauma; the amount of collateral circulation; the site of arteriovenous aneurysms, and in simple arterial aneurysm the position of the sac and its patency or obstruction by thrombosis. It has therefore been employed in these conditions when in spite of the clinical observations, aided by oscillometry, skin surface temperature readings, histamine wheal tests and so on, finer delineation of the pathologic changes is desired because of the continued progress of the disease. Furthermore, as stressed by Inclan [1] and reemphasized by Shallow,[2] arteriography should be performed in preference to specimen and punch biopsy in the early diagnosis of bone tumors, since the latter procedure in the case of malignant lesions may spread the disease into the very rich venous circulation. In addition, by arteriography one can determine the exact limits of the bone lesion, distinguish the benign and the inflammatory from the malignant, and denote the stage of the malignant growth.

Although arteriography is not universally practiced at present, the growing importance of this study in the more accurate diagnosis of arterial lesions and the earlier diagnosis of bone cancer encourages its more widespread employment. At the same time the procedure is not without danger, and for this reason the report of an untoward reaction is cited and in addition the various complications both local and systemic following peripheral arteriography are discussed.

Fig. 1.—Arteriogram in case of tuberculous osteomyelitis of proximal end of right ulna in an infant aged 14 months.

REPORT OF CASE

History.—D. L., a Negro girl aged 14 months, was admitted to the Jefferson Medical College Hospital on Nov. 18, 1942 because of swellings just below the right elbow, over the lower third of the right thigh and on the left forehead, first noted several days after birth.

The swelling of the elbow gradually increased, and about two weeks prior to admission the infant developed fever. At that time the swelling was incised and drained in the accident ward and about an ounce of pus (positive for Staphylococcus aureus) obtained. The wound did not heal well, and the infant was admitted to the hospital.

Except for the recent acute episode, the infant's general health had been good and growth was normal.

The mother had died two months previously from tuberculosis.

Physical Examination.—The infant was well developed and weighed 18 pounds 4 ounces (8,278 Gm.). The temperature was 102 F., the pulse rate 150 and the respiratory rate 54. At the upper end of the right ulna was a tender, indurated area, 4 cm. in diameter, from which there was slight drainage through a small recent incision. In addition there was a firm, round, fixed, nontender, semifluctuant mass 2 cm. in diameter on the left forehead as well as a similar mass 3 cm. in diameter on the anterior aspect of the lower third of the right thigh.

Laboratory Studies.—Hemoglobin was 61 per cent, red cells numbered 3,700,000 and white cells 22,800, with neutrophils 65 per cent (15 per cent young forms), lymphocytes 22 per cent and monocytes 13 per cent. Urinalysis revealed slight albuminuria. The blood Wassermann and Kahn reactions were negative. Repeated smears and cultures of pus from the elbow lesion were positive for Staphylococcus aureus but negative for acid fast bacilli. The tuberculin test was strongly positive following the first test dose.

X-ray examination revealed an expansile lesion somewhat cystic in nature, with numerous layers of periosteal new bone formation, involving the upper third of the right ulna, interpreted as either low grade osteomyelitis or a Ewing's tumor. The remainder of the skeleton was normal. The chest films revealed a widening of the superior mediastinum with densities

From the Samuel D. Gross Surgical Division of the Jefferson Medical College Hospital.

1. Inclan, A.: The Possibilities of the Roentgenographic Study of the Arterial Circulation in the Early Diagnosis of Bone Malignancy, J. Bone & Joint Surg. **24**: 259, 1942.

2. Shallow, T. A.; Raker, N., and Fry, K.: Primary Malignant Tumors of Bone with Special Reference to Osteogenic Sarcoma, J. Internat. Coll. Surgeons **6**: 89, 1943.

extending into both lung fields and displacement of the trachea to the right. The lung fields were otherwise clear, and the heart appeared normal.

Since by clinical and x-ray examination it was impossible with certainty to distinguish between a purely inflammatory lesion and a neoplastic one, and since it was desirable to avoid a biopsy, an arteriography was performed on Feb. 27, 1943 under open drop ether anesthesia. The brachial artery was exposed surgically at the lower third of the arm and 7 cc. of neo-iopax injected following temporary occlusion just above the site of the puncture. The films obtained (fig.1) showed an increase in the number of vessels around the upper end of the ulna, with dilatation and a fuzzy outline. Contrast material was seen in the large spaces within the bone structure. These findings were interpreted as representative of a low grade osteomyelitis of either a pyogenic or tuberculous origin.

About three minutes after the injection it was noted that the extremity was colder than the corresponding opposite member. The radial pulse, which previously had been of good quality, disappeared, and cyanosis of the finger tips was noted. The infant was returned to the ward and treatment begun immediately, consisting of elevation of the extremity, warm compresses, and papaverine for antispasmodic effect. Within forty-eight hours the forearm and hand became considerably swollen and diffusely tender. The fingers were partially flexed, and there were no spontaneous movements of the fingers or hand. Numerous ecchymotic areas varying in size from several millimeters to 2 cm. in diameter appeared on the fingers, dorsum of the hand and forearm. At this time the appearance of the arm resembled that seen in ischemic paralysis or Volkmann's contracture (fig. 2 *a*). Some of the ecchymotic areas resorbed, while blisters filled with serosanguineous fluid appeared over the others and subsequently broke down, forming superficial punched-out ulcers (fig. 2 *b*). At this time, five days after injection, the edema began to subside, and feeble attempts at spontaneous movements of the fingers were noted. The temperature, which before arteriography had ranged between normal and 102 F., continued at 103-104 F. for six days following injection and then gradually subsided.

During the next six months the arm was immobilized in a cast. The ulcers (fig. 2 *c*) as well as the bone lesion gradually healed during this time, and complete function of the extremity returned. Figure 2 *d* shows the appearance of the forearm and hand eight months after injection, at which time there was still absence of the radial pulse.

The nodule of the forehead was excised on April 28 and reported by the pathologist to be a tuberculous lesion. The lesion on the thigh disappeared over a period of several months, and the patient was discharged on September 7. On November 28 she was readmitted with severe gastroenteritis and died of disseminated tuberculosis on December 12. Permission for autopsy was unobtainable.

COMMENT

It seems likely that the complication in this case began with vasoconstriction resulting from the irritating effect of the contrast material. In view of the persistent absence of the radial pulse, the vasomotor reaction must have been followed by thrombosis of the brachial artery, but collateral circulation was sufficient to prevent gangrene.

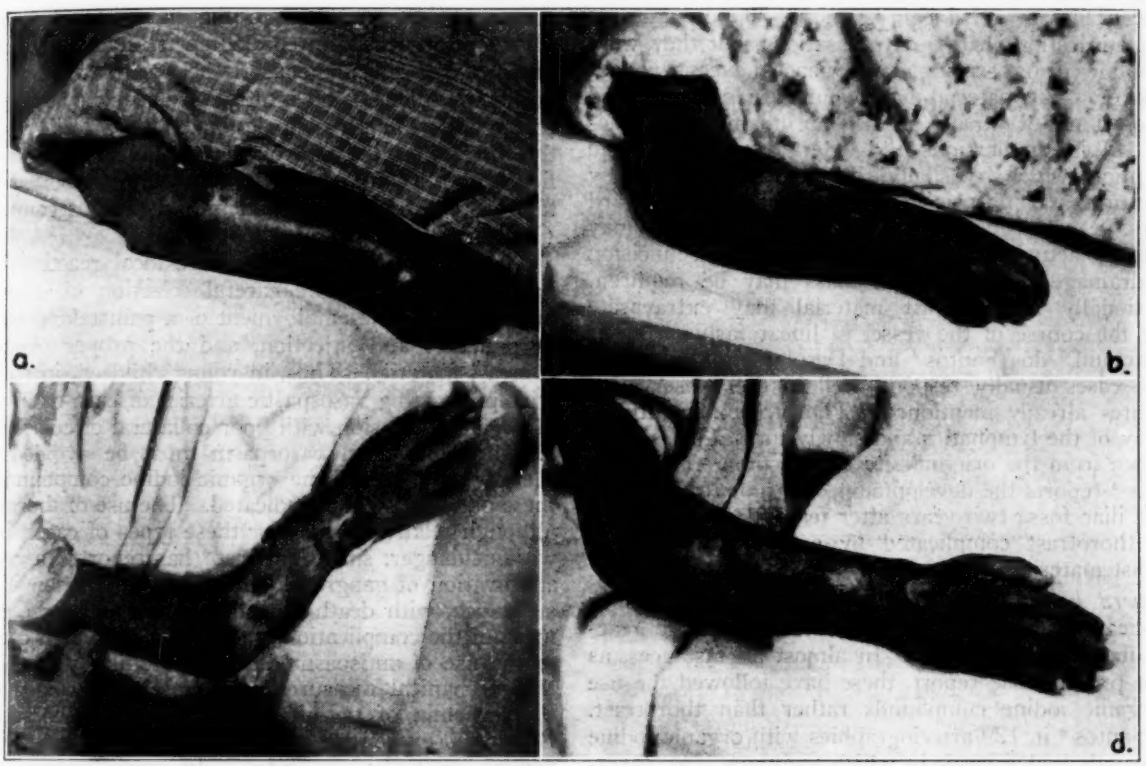

Fig 2.—Appearance of forearm and hand following arteriography complicated by arteriospasm and thrombosis: (*a*) Temporary Volkmann's contracture forty-eight hours later; (*b*) ulceration of skin with edema subsiding five days after injection; (*c*) ulcers almost healed six months later; (*d*) complete healing eight months after injection. Radial pulse still absent.

Complications both local and systemic following arteriography are most prone to occur at the two extremes of life, because in infancy and childhood the vessels are particularly susceptible to spasm, those of the upper extremity more so than the lower, and since in old age the incidence of arteriosclerotic occlusion is increased, with collateral circulation poor. In the etiology both mechanical and chemical factors play a role. Trauma to the artery as a result of puncture by the needle and the force of injection by arterial distention may in themselves provoke reflex vasoconstriction. The ideal contrast solution should be nontoxic, nonirritating, isotonic with the concentration of the blood and excreted promptly, but these criteria have not been completely satisfied by either thorotrast or the organic iodine compounds.

LOCAL REACTIONS

Hematomas.—A hematoma may follow the arterial puncture and in some cases an inadvertent venipuncture when the percutaneous route is used. It usually resorbs promptly following moist applications and external heat. Demel [3] states that in arteriosclerosis in 1 out of 300 cases there may be bleeding from the artery, readily controlled with a suture through the adventitia. Dos Santos,[4] among 1,500 arterial punctures, had only 1 case of persistent bleeding, necessitating ligation of an atheromatous femoral artery, and the patient recovered without gangrene.

Extravasations.—Displacement of the needle before or during injection may occur, with infiltration of the adventitia or periarterial tissue with contrast material. In 411 arteriographies with use of thorotrast dos Santos [4] had only 8 extravasations (less than 2 per cent). Dimtza and Jaeger [5] among 70 percutaneous arterial injections had 6 extravasations, but they were not followed by serious consequences except nausea and fever. The material may accumulate locally around the vessel and eventually produce an inflammatory reaction. Moist applications and external heat encourage resorption, which is usually slow and accompanied by induration and fibrosis but no permanent untoward effects. Less frequently the inflammatory reaction may proceed to actual suppuration, in which instance incision and drainage of a fluctuant mass may be required. Occasionally the contrast material may extravasate along the course of the vessel in linear fashion (cases of Garraud,[6] dos Santos [4] and Desplas and Reboul [7]). These cases usually respond well to the conservative measures already mentioned. Thorotrast may diffuse by way of the lymphatics and slowly form a mass some distance from the original site of injection. Thus, dos Santos [4] reports the development of a suppurative mass in the iliac fossa two years after femoral arteriography with thorotrast complicated by extravasation of the contrast material.

Severe Vasomotor Reactions.—Among the serious complications are severe immediate vasospastic reactions in the injected limb. In almost all instances, as in the present case report, these have followed the use of organic iodine compounds rather than thorotrast. Dos Santos [4] in 129 arteriographies with organic iodine compounds had 6 cases in which gangrene was aggravated, in contrast to no vasomotor reactions in more than 300 with thorotrast. The reaction is first manifested by severe pain in the limb and blanching followed by venous stasis. After several hours there appear scattered violet plaques, some of which may become confluent, in the skin distal to the point of injection, due to cutaneous and subcutaneous hemorrhages. Later they may appear proximal to the point of injection, as in a case of Lambret [8] and 1 of Leclerc [9] in which plaques appeared in the skin of the lower abdominal wall following femoral arteriography. Motor paralysis may occur, skin and tendon reflexes may be abolished and anesthesia may be present distal to the zone of injection. The pain usually subsides in two or three days. The cyanotic plaques slowly resorb, progressively passing through the various colors of a hematoma, and blisters may appear over some of them. Movement and sensitivity gradually return, and in a week to ten days the limb may become normal. In other cases a preexisting gangrene may be aggravated.

In a few instances the puncture site has been surgically explored. The muscles are engorged with dark blood which flows readily from the veins, but blood does not spurt from the arteries. On exposing the area of the puncture, there is no hematoma and the orifice of the puncture is not identifiable. According to Leveuf,[10] the artery does not pulsate and aspiration with a needle fails to obtain blood. On opening the artery a soft clot is found which does not prevent passage of the needle into the lumen of the vessel. Histologically the skin epithelium is intact. The capillaries of the subcutaneous tissue are dilated and congested, and there is an infiltration of leukocytes, chiefly eosinophils. There is no lesion of the arterial wall in the vicinity of the site of the puncture, and the orifice cannot be found. The arterial lumen often contains a recent thrombus undergoing rapid organization (Leveuf;[10] Sénèque and Benoit [11]).

The occurrence of these severe local reactions may be reduced by a more careful selection of cases for arteriography, the employment of a painstaking technic of puncture and injection, and the proper choice of contrast material. Thus, in young children, in patients with preexisting vasospastic arterial disease or in cases of organic occlusion with poor collateral circulation the risk of superadded vasospasm must be avoided, and therefore the use of the organic iodine compounds for these patients is contraindicated. The use of thorotrast, although relatively safer for these types of cases, is not without danger, since Lambret [8] has reported a case of aggravation of gangrene following the injection of this substance, with death nine days later. Definite treatment of the complication, once it has occurred, consists in the use of antispasmodic and vasodilator drugs and the mechanical measures commonly employed against the ischemia of peripheral vascular disease, such as Buerger's exercises, oscillating bed and intermittent venous occlusion apparatus. In some instances the development or aggravation of gangrene may require amputation (case of Leveuf [10]).

SYSTEMIC REACTIONS

Severe systemic reactions may occur following arteriography both with thorotrast and with the organic iodine compounds. Thus, dos Santos [4] has reported a case in which following the use of thorotrast there occurred hematemesis and a pronounced anemia with decreased coagulability of the blood but with recovery following transfusions. Arteriography was performed with thorotrast in the case of an infant because of a Volkmann's contracture, and death occurred the same evening following several arrests of respiration (Wertheimer and Frieh [12]). Some reports have emphasized the tendency of thorotrast to produce necrosis and neoplastic changes in tissues in which it is contained, particularly the cells of the reticuloendothelial system

3. Demel, R.: Diagnostic and Therapeutic Importance of Arteriography, Indian M. Rec. **58**: 197, 1938.
4. dos Santos, R.: Sur l'artériographie, Bull. et mém. Soc. nat. de chir. **61**: 585, 1935.
5. Dimtza, A., and Jaeger, W.: Ueber die Indikation der Arteriographie, Fortschr. a. d. Geb. d. Röntgenstrahlen **58**: 40, 1938. Zur Arteriographie der Extremitäten, Arch. f. klin. Chir. **196**: 631, 1939.
6. Garraud, R.: Les accidents de l'artério-contrastographie (étude clinique), Paris méd. **2**: 114, 1937.
7. Desplas, B., and Reboul, H.: Accidents de l'artériographie, Bull. et mém. Soc. nat. de chir. **61**: 10, 1935.
8. Lambret, O.: Accidents de l'artériographie, Bull. et mém. Soc. nat. de chir. **61**: 173, 1935.
9. Leclerc, G.: Accidents de l'artériographie, Bull. et mém. Soc. nat. de chir. **61**: 180, 1935.
10. Leveuf, J.: Les dangers de l'artériographie, Bull. et mém. Soc. nat. de chir. **61**: 6, 1935.
11. Sénèque, J. and Benoit: Sur les accidents de l'artériographie, Bull. et mém. Soc. nat. de chir. **61**: 16, 1935.
12. Wertheimer, P., and Frieh, P.: A propos de 77 artériographies, Bull. et mém. Soc. nat. de chir. **61**: 361, 1935.

in the liver and spleen, in which its radioactivity may be maintained for ten to fifteen years; but just how much damage may result in human beings has not been established, and to date no effects of this nature have been described following the small doses used for arteriography of the peripheral vessels.

Systemic reactions following the injection of organic iodine compounds consist of flushing of the skin with a feeling of warmth, erythematous eruptions, nausea, vomiting, cyanosis, respiratory distress and fall in blood pressure. These reactions usually subside within a few minutes to an hour, but the skin eruptions may persist for several days. Death may occur as an immediate reaction as the result of hypersensitivity or idiosyncrasy to the injected material, or else delayed, in which instance it is thought to be due mainly to preexisting extensive renal damage. Pendergrass and his co-workers [13] conducted a survey of deaths following the administration of organic iodine compounds as contrast mediums in 661,800 examinations, mostly urographic, and collected, in addition to the 11 previously reported cases, 26, representing an incidence of 0.0039 per cent. The latter figure, although not strictly representative for arteriography, gives some idea of the risk of fatality associated with the injection of these substances into the blood stream.

A decrease in the number of fatalities can be achieved by a strict adherence to the contraindications for use of the various contrast mediums and by prompt treatment when systemic reactions unexpectedly occur. In New and Nonofficial Remedies for 1943 [14] the contraindications listed for contrast mediums are severe liver disorders, nephritis and uremia. It is further advised in this issue that they be employed with caution in pulmonary tuberculosis and hyperthyroidism. Because of the reported fatalities due to hypersensitivity, it is essential that a careful allergy history be taken as well as the performance of one of the standard sensitivity tests for the contrast material such as the patch, intradermal, conjunctival, mouth or intravenous test. Patients with suspected kidney disease should have renal function tests performed and arteriography withheld on those with significant impairment. As it is now well known that even these precautions and tests do not warn adequately in all cases against sensitivity and toxic reactions, it is important to have facilities available for the immediate intravenous administration of epinephrine (1:1,000), caffeine and sodium benzoate, nikethamide or calcium gluconate.

CONCLUSIONS

Arteriography of the peripheral vessels is of value in the accurate diagnosis of arterial lesions and the early diagnosis of bone cancer but is not without danger.

The risk of complications does not warrant the abandonment of arteriography as a diagnostic aid but rather should keep one alert to minimize the danger by a proper selection of cases, careful choice of contrast material associated with the taking of an allergy history and the performance of a standard sensitivity test, painstaking technic and preparedness for prompt treatment if the necessity arises.

13. Pendergrass, E. P.; Chamberlin, G. W.; Godfrey, E. W., and Burdick, E. D.: A Survey of Deaths and Unfavorable Sequelae Following the Administration of Contrast Media, Am. J. Roentgenol. **48**: 741, 1942.

14. New and Nonofficial Remedies, Issued Under the Direction and Supervision of the Council on Pharmacy and Chemistry, Chicago, American Medical Association Press, 1943, p. 331.

STUDIES ON HUMAN SCHISTOSOMA MANSONI INFECTIONS

I. PROCTOSCOPIC PICTURE IN ASYMPTOMATIC SCHISTOSOMIASIS MANSONI INFECTIONS

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CAPTAIN DUDLEY W. HARGRAVE
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In the physical processing of Puerto Rican male inductees for Selective Service, a routine stool examination has been required by the Antilles Department. As a result of this type of examination, approximately 10 per cent [1] of otherwise healthy males were found positive for the ova of Schistosoma mansoni. A report of the Survey by Antilles Department Laboratory will appear shortly as part of this series of studies. In the light of this fact it was decided to carry on a proctologic study of a group of ova positive applicants, in an effort to ascertain what pathologic changes, if any, were demonstrable in the rectal mucosa of the hosts.

Proctoscopic Observations

	Number	Per Cent
Normal mucosa	61	39.3
Normal mucosa with ulceration	75	48.5
Normal mucosa with polyps	2	1.3
Normal mucosa with hemorrhagic areas	13	8.3
Atrophic mucosa	2	1.3
Inflammation	2	1.3

The finding of changes in the rectal mucosa in 60.7 per cent of the 155 persons examined is in keeping with our understanding of the pathologic changes which take place in this infection and with our present knowledge of the life history of the infecting parasite.

METHODS AND RESULTS

These young men were hospitalized in the gastrointestinal ward, given a low tepid water enema and then examined proctoscopically. External and digital examinations were entirely negative and failed to reveal any evidence of hemorrhoids, eversions of the rectum, tumor masses or other pathologic changes. The proctoscope was passed under direct vision up to the rectosigmoid fold in all patients and for 4 cm. to 5 cm. within the sigmoid colon in about one half of the patients.

The mucosa was entirely normal in 61 persons, or 39.3 per cent of the examinations. In 94 persons (60.7 per cent) proctoscopy revealed ulcerations which have been found to be characteristic of infections with S. mansoni.

This is the first of a series of studies carried on by members of the Medical Corps, Antilles Department.

Lieutenant Colonel Bercovitz was formerly assistant clinical professor of medicine, New York Post-Graduate Medical School, Columbia University, New York, on leave of absence.

Captain Rodriguez-Molina was formerly associate professor of tropical medicine, Puerto Rico School of Tropical Medicine, San Juan, Puerto Rico, on leave of absence.

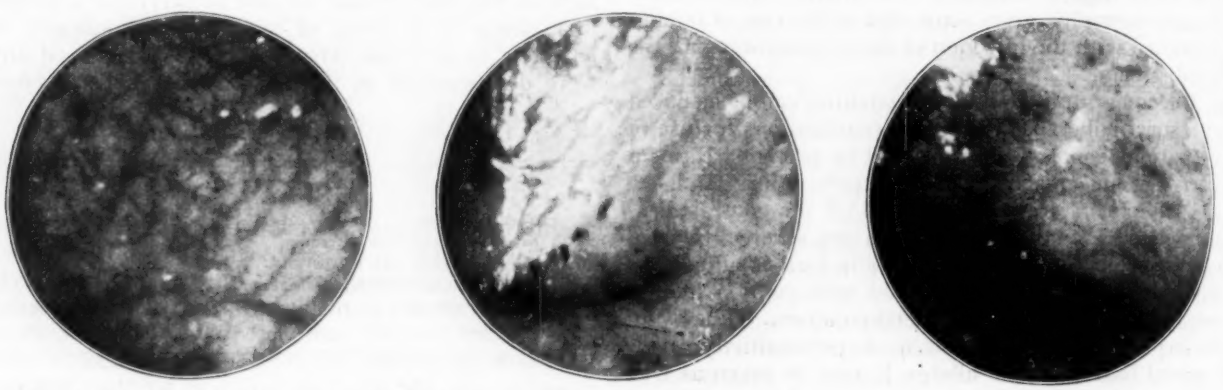
This study was made at the suggestion of Col. Clyde C. Johnston, Department Surgeon, Antilles Department.

1. Dammin, G. J., and Weller, T. H.: Personal communication to the authors.

The ulcerations were single pin point, located just below the rectosigmoid fold in 12.7 per cent (12 examinations), the remainder of the mucosa being entirely normal. In 10 other examinations (10.6 per cent) there were single linear ulcers which appeared as a crack in the otherwise healthy mucosa. These single linear ulcerations were up to 3 mm. in length.

The ulcerations were multiple in 77 of the examinations (81.6 per cent) and included both pin point as well as linear ulcerations. When pin point or oval they were up to 1 to 2 mm. in diameter and as much as 3 mm. in length when linear.

There was sharp demarcation of the ulcerated area from the surrounding normal mucosa. There was no zone of inflammation, no crater or ragged edges and no exudate that could be seen. The ulceration appeared as a noninflammatory spot giving the impression that something had extruded through the mucosa into the lumen of the bowel. When examined with a proctoscope there was a definite break in continuity of the mucosa, and free blood was seen to ooze from these areas. When this was wiped off, the noninflammatory ulceration was visualized. In those instances which were reexamined the following day it was noted that many of the ulcerations seen on the previous day had disappeared.



Reproductions from kodachromes made through the proctoscope, showing ulcerations at the bifurcations of the capillaries superimposed on the vessels and outlining the blood vascular pattern.

The ulcerations were nearly always either at the bifurcation of the capillaries or lying directly on them. This relationship of the ulcerations to the blood vessels of the rectum was so constant that a definite relationship was established. It should be noted that the capillaries and in some instances the venules were readily visualized. In some instances in which the ulcerations were numerous they could be seen following the course of the capillaries, outlining them in a definite pattern.

The ulcerations were located below the rectosigmoid fold. In only 1 instance was there a suggestive area on the fold. Polyps were seen in but 2 cases, one being 3 to 4 mm. long, the other about 1 cm. and pedunculated.

COMMENT

The finding of ulcerations as described is in accord with the pathologic picture as given by Koppisch,[2] who has also described the method of extrusion of the ova of S. mansoni through the mucosa into the lumen of the bowel. This picture has been summarized by Faust,[3] who states that "the presence of eggs in the tissues of the gut provokes a dense cellular infiltration, leading to a thickening of the bowel wall and an excess of mucus production. These lesions gradually enlarge, so that on the mucosal surface localized areas of hyperemic tissues develop into abscesses, which break through the mucosa to the surface, causing minute hemorrhages with the discharge of bloody mucus, pus and eggs. These minute ulcers frequently become quite extensive, particularly if secondary infection develops."

In the sixth of a series of studies on schistosomiasis mansoni Koppisch[4] describes the morbid anatomy of schistosomiasis as found in 147 autopsies on Puerto Rican patients. Depending on the degree of severity of infection and the duration of the disease, he grouped the cases according to whether the infection was minimal, moderate, severe, healed or doubtful. He found that 64.6 per cent of his cases were minimal and had no clearcut clinical manifestations of schistosomiasis or gross pathologic changes at autopsy which were of diagnostic import.

The group of moderately advanced cases comprised 14.2 per cent, and he noted that schistosomiasis was inapparent clinically. Severe cases made up only 8.1 per cent of the number, and this group is representative of the last stages of the disease. The mucosal venules and submucosal veins were dilated and engorged with blood in many of the severe cases even in the absence of acute colitis.

The present conception of schistosomiasis mansoni infection as just described in human beings has been that of bloody diarrhea with mucus, followed in the untreated cases by involvement of the liver and spleen in the so-called visceral schistosomiasis. Actually this picture in its various modifications takes place in only 4 per cent of the cases, as shown by Koppisch,[4] and fails to account for the fact that ulcerations in the rectal mucosa were found in 60.7 per cent of 155 otherwise perfectly healthy young Puerto Rican men in whom the ova of S. mansoni had been found on fecal examinations.

It is evident from this study that the finding of ova of Schistosoma mansoni in the stools is equivalent in at least 60.7 per cent of the cases to the finding of ulcerations in the bowel mucosa and definitely indicates infection with this parasite. There is no such condition as a healthy carrier of S. mansoni, and the

2. Koppisch, E.: Manson's Schistosomiasis, J. A. M. A. **121**: 936 (March 20) 1943.
3. Faust, E. C.: Human Helminthology, Philadelphia, Lea & Febiger, 1939.
4. Koppisch, E.: Studies on Schistosomiasis Mansoni in Puerto Rico: VI. Morbid Anatomy of the Disease as Found in Puerto Ricans, Puerto Rico J. Pub. Health & Trop. Med. **16**: 395 (March) 1941.

presence of ova is equivalent to the diagnosis of schistosomiasis.

As a result therefore of these studies, careful examinations of the feces must be made of all persons who have been living in an area suspected of being infected with S. mansoni even though those persons do not complain of any symptoms or present signs suggestive of schistosomiasis.

SUMMARY

Ulcerations of the rectal mucosa were found in 60.7 per cent of 155 otherwise healthy Puerto Rican young men in whom ova of S. mansoni were discovered on routine fecal examinations. The bowel mucosa was generally soft, velvety and pale pink, with single or multiple ulcerations which were either pin point or linear. There was sharp demarcation of the ulcerated area from the surrounding normal mucosa and there was no zone of inflammation, no crater or ragged edges and no exudate. The ulceration was a noninflammatory break in the continuity through which oozed a small amount of blood. The ulcerations were at the bifurcation of the capillaries or lying directly on them. This relationship of the ulceration to the blood vessels was so constant that a definite relationship could be established. When the ulcerations were numerous, they outlined the pattern of the capillaries. The ulcerations were below the rectosigmoid fold. Polyps were seen in only 2 instances.

A review of the present concepts of schistosomiasis infections as pointed out by Faust, Strong, Koppisch and others in clinical-pathologic studies fails to account for this larger group of individuals who are infected with this parasite and have definite pathologic findings present in the rectal mucosa but do not have any clinical symptoms.

The diagnosis of schistosomiasis must be considered in any person who has lived in a geographic area suspected of harboring S. mansoni. It is the responsibility of the physician to rule it out by careful repeated examinations of the stools by any and all concentration methods even though no symptoms are present. Infection with Schistosoma mansoni indicates schistosomiasis. There is no such condition as a healthy carrier of schistosomiasis.

William Harvey.—William Harvey (1578-1657), the greatest name in English medicine and one of the greatest names in all experimental science, was born in Folkstone. He attended Granville and Caius colleges, Cambridge, and afterward studied at Padua, where his professor was Fabricius, whose work on the valves in the veins and the development of the chick profoundly influenced Harvey's two great works. He returned to England, taught at the College of Physicians in London, saw military service in the Civil War on the Royalist side, died in London at an advanced age and was buried at Hempstead, Essex. De motu cordis et sanguinis (On the Motion of the Heart and Blood) was published in 1628 and went through many editions. De generatione animalium (on the Generation of Animals), published in 1651, gives him the right to the title of the father of embryology. It has been claimed for others that they announced the circulation of the blood. Undoubtedly this is partially true. Fabricius described the valves in the veins, but he missed their significance. Servetus (Christianismi Restituio, 1553) described the pulmonary circulation. Cesalpinus and Realdus Columbus both described the circulation, but from speculation; Harvey proved it by experiment.—Clendening, Logan: Source Book of Medical History, New York, Paul B. Hoeber, Inc., 1942.

AMEBIC ABSCESS OF THE LIVER UNSUSPECTED UNTIL PERFORATION

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The sudden perforation of unsuspected, asymptomatic amebic abscesses of the livers of 2 naval patients returning from the South Pacific combat zone has led us to speculate on the possibility that a similar type of condition may be encountered among other persons who are returning from these regions. Because of the considerable delay between the onset of symptoms and the recognition of the disease in the 1933 epidemic and the consequent loss of life, it seemed advisable to report these 2 recent cases.

The patients were enlisted personnel of the Navy who had been on duty on one of the islands in the South Pacific war zone. They were returned with diagnoses of filariasis which they had on admission to a naval hospital on the mainland.

In both cases a diagnosis of amebic abscess of the liver was made only after perforation of the abscess to the subdiaphragmatic region. In the first case, although emetine therapy was instituted and a definite specific response was obtained, surgical drainage seemed advisable because of progressive signs and symptoms of impending perforation of the abscess through the diaphragm into the right pleural cavity. In the second case, in spite of daily doses of emetine for three days, the symptoms and signs were so acute and severe that perforation of the abscess into the peritoneal cavity was feared, and immediate operative drainage seemed imperative.

Of striking significance in each case was the similarity of symptoms when the abscess perforated to the right subdiaphragmatic region. These symptoms consisted in the sudden development of aching pain in the right shoulder, in the right costovertebral region and lower portion of the right thorax associated with chills and fever. The thoracic pain extended to the abdomen, and muscle spasm was present in the right upper quadrant. Roentgenograms of the thorax revealed no evidence of pneumonia but progressive elevation of the right half of the diaphragm and a loss of the acute cardiophrenic angle in the other. The temperature varied daily in both cases over approximately 4 degrees F., and in the second case the pulse rate increased to a maximum of 140 beats per minute on the day of operation. Pronounced leukocytosis was present in both cases. Exposure of the right subdiaphragmatic space was made through right subcostal incisions. The amebic abscess in the liver was found to communicate with the subdiaphragmatic abscess. Drainage of both was followed by progressive and complete recovery.

Captain Walters, Captain Watkins and Lieutenant Butt are on leave of absence from the Mayo Clinic, Rochester, Minn.

This article has been released for publication by the Division of Publications of the Bureau of Medicine and Surgery of the U. S. Navy. The opinions and views set forth in this article are those of the writers and are not to be considered as reflecting the policies of the Navy Department.

REPORT OF CASES

CASE 1.—On Jan. 16, 1943 a man aged 23 was admitted to the hospital from the South Pacific zone with a diagnosis of lymphangitis of the right spermatic cord. The right epididymis and right spermatic cord had been swollen for four and a half months. He was studied thoroughly by the Filarial Commis-

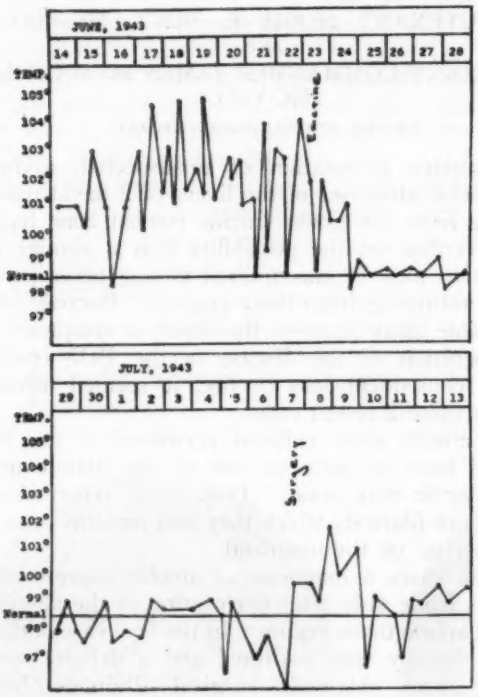

Fig. 1 (case 1).—Temperature chart showing intermittent fever following perforation of amebic abscess of the liver to right subdiaphragmatic region. The response to full course of emetine therapy may be noted.

sion. It was possible to place him on outside duty on March 9, and later he was placed on an outside work detail. Roentgen therapy was given over both inguinal and femoral regions, left axilla and left epitrochlear region from April 7 to 14 inclusive. On the patient's return from a therapeutic leave of thirty days he was placed on the outside detail, which involved hard work. Swelling of the spermatic cord or epididymis did not recur.

Fig. 2 (case 1).—Elevation of right half of diaphragm on July 5, 1943.

The patient's present illness began June 12, 1943 with aching in the right shoulder, coughing with scanty sputum which was not tinged with blood, malaise and pain in the small of the back. Pain on inspiration became manifest on June 13 and persisted. His temperature varied from 98.6 to 103 F. and he had severe pain in the right lower portion of the thorax. Respirations numbered 28 per minute (fig. 1). Considerable tenderness and muscle spasm were present in the upper part of the abdomen on the right side. The liver was enlarged and tender. The leukocyte count was 28,000 per cubic millimeter of blood. Roentgenographic examination of the thorax was negative. Administration of sulfadiazine was started on June 16. A chill occurred on June 17, but the blood smear made at that time was reported negative for malaria. On June 20 the patient still complained of severe pain in the lower part of the thorax. Repeated roentgenologic examinations of the thorax after June 16 showed a progressive elevation of the right half of the diaphragm with an irregular dome-shaped bulge (figs. 2 and 3).

The patient gave a history of having had amebiasis in 1941 with positive findings on examinations of the stools. After a course of emetine therapy stool examinations had given negative results and at the time of the admission to the hospital in June 1943 gave negative results for ameba. There had been no diarrhea.

On June 23 a diagnosis of subdiaphragmatic abscess on the right side was made. Treatment with emetine hydrochloride and carbarsone was started; 3 grains (0.2 Gm.) of emetine hydrochloride was given on the first day, 2 grains (0.13 Gm.) on the second day and then 1 grain (0.065 Gm.) the following four days; a total of 9 grains (0.6 Gm.) was administered. Two days following the institution of emetine therapy the patient's temperature returned to normal and varied from 97.5 to 99 F. for twelve days. During this time the right half of the diaphragm continued to elevate progressively.

Drainage of the subdiaphragmatic abscess was decided on, and accordingly this was done on September 7. An abscess cavity 10 cm. in diameter was found in the right lobe of the liver, with an opening 5 cm. in diameter into the subdiaphragmatic abscess cavity. Both cavities contained approximately 1,000 cc. of yellowish white, thick, purulent débris with clots of fibrin. Smear and culture revealed gram-positive cocci. A strip of iodoform gauze impregnated with sulfanilamide powder was placed in the cavity of the liver and Penrose drains in the subdiaphragmatic abscess cavity.

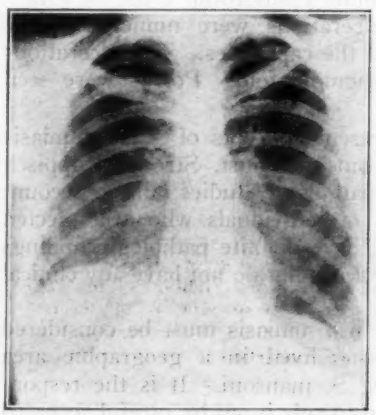

Fig. 3 (case 1).—Increase in elevation of diaphragm on July 23, 1943.

The temperature rose to 101.5 F. for two days after operation and then returned to normal. Roentgenologic examination of the cavity, after injection of radiopaque oil (lipiodol) revealed that the cavity was decreasing progressively. A catheter, which was inserted into the abscess cavity in the liver for drainage at the time of operation, was removed completely on October 12. Healing of the sinus occurred in a few days. Since that time the patient has been well and afebrile.

CASE 2.—A man aged 23 was admitted to the hospital on Aug. 6, 1943 with diagnosis of lymphadenitis. He had served in Samoa from March 19, 1942 to Jan. 17, 1943 and in New Caledonia, New Hebrides and Russell islands until July 13, 1943.

On September 3 the patient was examined by the Filarial Commission, which found a little residual evidence of adenitis. He was placed on outside detail, which involved hard work. On September 30 he complained of sore throat; on examination his temperature was 99.8 F. and his throat was red and infected. Culture of material from the throat revealed hemolytic streptococci. Accordingly on October 1 the diagnosis was changed to acute pharyngitis. On October 4 the patient complained of severe spasmodic pain in the right upper quadrant of the abdomen with tenderness and muscle spasm particularly in the region of the upper right rectus muscle. The condition was thought to be diaphragmatic pleurisy or beginning amebic abscess of the liver. The patient had pain and tenderness over the right lower portion of the thorax and abdomen, intermittent fever to 103 F. and an occasional chill (fig. 4). Progressive downward enlargement of the liver occurred. The leukocyte count was 19,500 per cubic millimeter of blood. Roentgenologic examination of the lungs showed no evidence of pneumonia but a widening of the cardiophrenic angle (fig. 5).

Blood culture was negative, as was examination of the stool for amebas. The patient was given 1 grain (0.065 Gm.) of emetine on October 7, 8 and 9 without apparent benefit. Roentgenograms of the thorax on October 9 revealed an increase in the elevation of the right side of the diaphragm and no evidence of pneumonia.

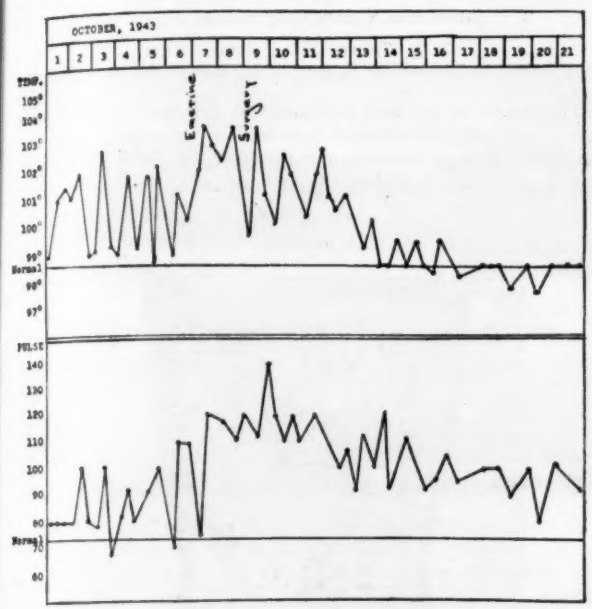

Fig. 4 (case 2).—Temperature chart showing septic type fever with proportionate increase in pulse rate. Temperature and pulse failed to respond to administration of emetine and were increased at time of emergency surgical drainage.

A diagnosis of hepatic abscess of unknown origin was made and, in view of the extremely serious condition of the patient, the progressive increase in the pulse rate to 140 beats per minute and the temperature to 103.5 F., operation seemed advisable. This operation was undertaken in spite of the possibility that an amebic abscess of the liver with perforation might be encountered and that an inadequate amount of emetine had been given. On October 9 a subdiaphragmatic abscess containing about 8 ounces (240 cc.) of typical amebic material was drained through a right subcostal incision. An abscess cavity approximately 12.5 cm. in diameter was found in the right lobe of the liver by needle aspiration. This cavity was opened and about 500 to 700 cc. of creamy white pus with fibrin and cellular débris was drained out. Smear and culture revealed Endamoeba histolytica. A strip of iodoform gauze, impregnated with 5 Gm. of sulfanilamide, was inserted into the abscess cavity within the liver. This was removed on the twelfth postoperative day after repeated daily soakings with 1:5,000 solution of potassium permanganate. Penrose drains were used to drain the subdiaphragmatic abscess.

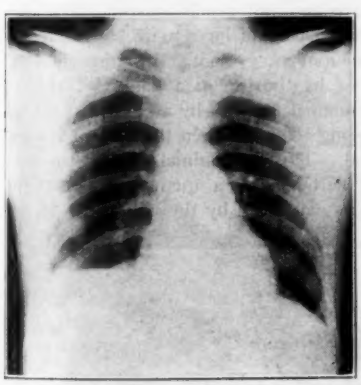

Fig. 5 (case 2).—Elevation of right half of the diaphragm with a change in the right cardiophrenic angle to a right angle.

On the evening of the day of operation the patient gave evidence of shock, with rapid pulse rate and blood pressure of 76 mm. of mercury systolic and 54 mm. diastolic. Five hundred cc. of blood plasma was administered. Two grains (0.13 Gm.) of emetine was injected subcutaneously on the day of operation and 1 grain (0.065 Gm.) each day thereafter for seven days. After removal of the gauze pack from the abscess cavity in the liver, a catheter was inserted into it for irrigation and drainage in order to allow complete closure of the cavity. The fever decreased by lysis and became normal on October 17. The cavity obliterated itself and the sinus healed after removal of the catheter.

COMMENT

Amebiasis is a much more frequent disease than has been commonly supposed. It is certainly endemic in many portions of the United States and present in all sections. With the present worldwide dispersal of our armed forces and their subsequent return home, this disease will be encountered with increasing frequency. The percentage of cases of amebiasis in which amebic hepatitis or abscess develops is unknown and depends on several factors, chief of which are promptness of recognition and thoroughness of treatment. It seems reasonable to suppose that under utopian conditions, if all patients with fresh infections of Endamoeba histolytica were promptly and thoroughly treated amebic disease of the liver would not occur, as hepatic involvement is always a secondary complication to the disease in the colon. This statement does not mean that every patient who has amebic disease of the liver has a diarrhea or even that he has had diarrhea. It is apparent that many amebic infections of the colon are largely asymptomatic. Of Ochsner and DeBakey's [1] 741 collected cases a history of diarrhea was found in 58 per cent and diarrhea at the time of the patient's admission to the hospital because of the amebic disease of the liver was found in only 21 per cent. Seventeen and four tenths per cent of the number of patients admitted because of amebic dysentery to the Charity Hospital in New Orleans had amebic abscess of the liver.

Our first patient gave a history of amebic dysentery in 1941. After emetine therapy stool examinations did not reveal any amebas and since that time noticeable or remarkable episodes of diarrhea had not occurred. He did not have diarrhea while in this hospital. In case 2 diarrhea had not occurred at any time.

Although the symptoms of amebic abscess of the liver are chills and fever, lower thoracic and upper abdominal pain accompanied by nausea and vomiting, loss of weight and weakness, these symptoms were entirely lacking in our 2 cases until the amebic abscess of the liver perforated to the subdiaphragmatic region. Enlargement of the liver and abdominal tenderness also were absent until perforation occurred. The finding of Endamoeba histolytica in the stools would clinch the diagnosis in cases in which the usual symptoms and physical findings are encountered. Endamoeba histolytica, however, was absent from the stools of both our patients.

Ever since Rogers [2] in 1922 clarified the etiology, pathology and treatment of amebiasis of the liver, the problem has been one of increasing medical and decreasing surgical significance. Nevertheless, the surgeon plays an important, and frequently dramatic, role in the successful treatment in these cases.

As a result of Rogers' many years of study of amebiasis in India, he was able, for the first time, to establish three fundamental facts which completely revolutionized the therapeutic concept of this disease. First, he

1. Ochsner, Alton, and DeBakey, Michael: Surgical Considerations of Amebiasis, Internat. Abstr. Surg. **69**: 392-403, in Surgery, Gynecology and Obstetrics, October 1939; Amebic Hepatitis and Hepatic Abscess.[4]

2. Rogers, Leonard: Amebic Liver Abscess: Its Pathology, Prevention and Cure: Lecture I. Etiology and Pathology of Amebic Liver Abscess, Lancet. **1**: 463-469 (March 11); Lecture II. The Varieties and Treatment of Amebic Liver Abscess, ibid., March 25, pp. 569-575; Lecture III. The Prevention of Amebic Liver Abscess and the Recent Reduction in Its Prevalence and Mortality, April 8, pp. 677-684, 1922.

conclusively demonstrated that amebic abscess of the liver is caused by Endamoeba histolytica specifically and is therefore differentiated from pyogenic abscess of the liver. Second, he proved beyond question that emetine is a specific and highly effective drug in the treatment of amebic disease of the liver. Third, he reduced the mortality rate in his cases from 57 per cent to 14 per cent by substituting emetine therapy combined with closed aspiration of the abscess for the previously used open operation. Berne [3] reported the results of treatment in 63 cases at the Los Angeles General Hospital. Nineteen patients, including 3 who had hepaticobronchial fistula, were treated with emetine alone and all recovered. Eighteen patients were treated with emetine first and subsequently aspiration was performed; all recovered. Twenty-six patients were treated by open surgical drainage, some with and some without emetine; 14 (54 per cent) died.

Ochsner and DeBakey [4] reported a series of 80 cases in which open drainage was performed with a mortality rate of 22.1 per cent, whereas by means of conservative treatment (administration of emetine hydrochloride with or without drainage by aspiration) in 83 cases they reduced the mortality rate to 3.6 per cent. Following this statement, however, they said "Of interest also is the fact that aspiration was performed without preliminary emetine in 2 of the 3 fatal cases. . . . The other patient was treated with emetine and anayodin on the medical service for almost three weeks and no attempt made to drain the hepatic abscess. At autopsy a huge hepatic abscess measuring approximately 20 cm. in diameter was found in addition to several smaller abscesses. We are firmly convinced that these three tragedies could have been averted, the first two by the preliminary administration of emetine and the third by aspiration of the abscess in addition to the use of emetine."

We believe that, whenever amebic abscess of the liver is suspected, treatment with adequate amounts of emetine should be tried first. If the patient does not recover completely or if persistent enlargement or deformity of the liver is demonstrated clinically or roentgenologically, aspiration is indicated, but it is preferable not to perform it through an uninvolved serous cavity. Open surgical drainage should be used only when acute perforation into the peritoneum or pleura is actual or impending or when there is proved pyogenic contamination.

SUMMARY

In the 2 cases of unsuspected amebic abscess of the liver reported, symptoms occurred only on perforation of the abscess to the right subdiaphragmatic region. Both patients had had naval duty at one or more of the South Pacific islands and had been returned to the mainland because of a diagnosis of lymphadenitis. In neither case was diarrhea present nor were amebas found in the stools. In case 1 the general condition improved after the administration of emetine but the subdiaphragmatic abscess increased in size and open operation was performed. In case 2 there was no apparent response to emetine. Because of the patient's critical condition, surgical drainage was performed as an emergency procedure. Both patients made excellent recoveries.

3. Berne, C. J.: Diagnosis and Treatment of Amebic Liver Abscess, Surg., Gynec. & Obst. **75**: 235-238 (Aug.) 1942.

4. Ochsner, Alton and DeBakey, Michael: Amebic Hepatitis and Hepatic Abscess: An Analysis of 181 Cases with Review of the Literature, Surgery **13**: 460-493 (March), 612-649 (April) 1943.

Clinical Notes, Suggestions and New Instruments

A PNEUMATIC LEG SPLINT

A PRELIMINARY REPORT

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Chief of Division for Surgery of Trauma, Hurley Hospital

This piece of fracture equipment is designed to employ the use of air properly encased between two layers of supporting material. It is an inflation unit for emergency care of fractured lower extremities. The two layers are cut to selected measurements and sealed at the edges. The air intake is through a valve located at either the upper or the lower portion (figs. 1 and 2). The latter location is preferable. Hooks are attached to the anterior coaptation edges and evenly spaced. The unit is folded around the affected part and laced with leather lacing material in the same fashion as a boot. Inflation follows, either by mouth blowing or by the use of a pump. The fractured extremity is held in manual traction by an assistant during application and inflation, being released when the desired amount of air has been introduced. This is minimal and is approximately 8 to 10 mm. of mercury, or a quantity sufficient to produce splinting comfort as evidenced by the patient's reaction.

Fig. 1.—The pneumatic leg splint open. Note valve at upper thigh part, side cuffs with snaps, and hooks for lacing.

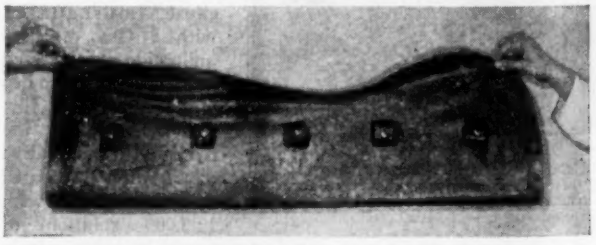

Fig. 2.—The pneumatic leg splint closed. Lateral view. Note position of valve and the hooks for lacing arrangement. Also cuffs and snaps for Thomas splint attachment or application of additional support from poles, sticks, broom handles, mop handles and the like.

Investigation of this problem has been carried on in the Department for Surgery of Trauma, Hurley Hospital, Flint, Mich. So far only fractures of the lower extremity have

been managed, for which the splint seems more appropriate. They were simple, compound, single and multiple in type, involving the femur, knee and leg. The unit remained in place from a few hours to six days and was considered only on an emergency basis, filling the gap between the occurrence of the fracture and the beginning of some definitive type of treatment. This obviously means the phase which includes first aid and associated transportation requirements.

Fig. 3.—The pneumatic leg splint in place, inflated, for fractured tibia and fibula, lower third. Supplementary splint aids are unnecessary.

Fig. 4.—Same as figure 3, side view.

The first material used was synthetic rubberized fabric. For the past few months a more durable, pliable and specially prepared material has been obtainable in small amounts. Construction changes took place. Cuffs with snaps or buckles were added to the sides so that the splint could be attached to a Thomas splint (figs. 5 and 6). Several splints were made with a canvas covering, thus giving added protection against punctures, wear and tear. This acted as an envelop for the inner lighter compartment, the inflatable portion, making the unit quite snag proof. Reinforcements were added to areas subjected to extra stress and strain. Two sizes were made, large and medium, the difference being in length and circumference by a few inches. The use of broom and mop handles or any stick of proper size has been suggested for additional

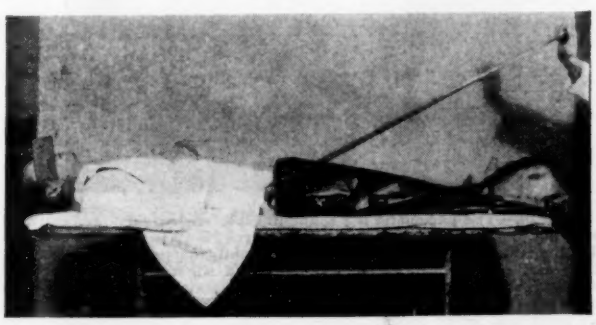

Fig. 5.—Combination of Thomas splint and pneumatic leg splint for fractured femur—mid third. The Thomas splint is applied first and held upward. The pneumatic leg splint is folded around the extremity, deflated The Thomas splint is then lowered, attached to the pneumatic leg splint, and the latter is inflated. Fixation and auto traction are thus produced.

support or facilitation of handling or transportation. These are attached to the splint by means of the cuffs.

For fractures involving the knee, lower end of the femur, leg and ankle the Thomas splint is not used (figs. 3 and 4). The latter is added as a supplemental aid in femoral fractures—middle and upper thirds. Application of the Thomas spint is done first, attached to the sides of the pneumatic leg splint by cuffs with snaps or buckles (fig. 5). The Thomas spint is held upward; the pneumatic leg splint is applied and inflated after attachment to the Thomas splint (figs. 6 and 8). Application with or without the Thomas splint is simple and rapid. The unit can be stored in a small space.

COMMENT

The principle of the pneumatic leg splint is similar to that of the pillow splint, except that air pressure is constant and evenly distributed. The amount of air used, as stated, is a quantity sufficient to produce splinting comfort. In all cases comfort was obtained. Transportation of the patient was accomplished with a minimum of discomfort. All movements of the lower extremity were practically painless. Frequent check-up x-ray examinations showed little or no change in the postion of bone fragments. There was minimal edema at the fracture site. There was an intimate hugging of the surface contour of the extremity by the inner layer with the space for air between the layers remaining constant (figs. 7 and 9).

Fig. 6.—The pneumatic leg splint, inflated, with Thomas splint attached, for midfemoral fractures. Note pressure against the longitudinal Thomas splint bars. Traction may be added from lower foot portion of the pneumatic leg splint to end of Thomas splint.

The contact of rubber and skin over a period of time is expected to produce irritation. This finding was present over the malleoli in cases in which the splint remained in place for

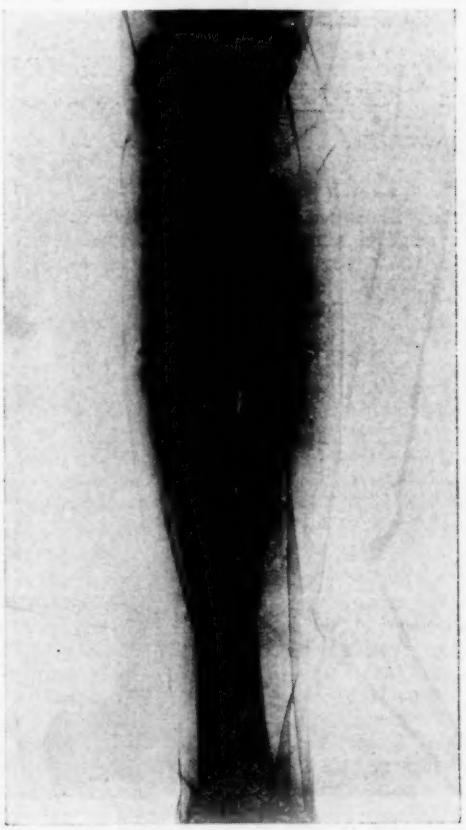

Fig. 7.—Fracture of tibia and fibula at junction of middle and lower thirds. Anteroposterior view. Note inner layer of the splint hugging the surface contour of the leg. Note outer splint layer with air spaces between.

five or six days. It was negligible and quickly disappeared following removal. The application of stockinet eliminated this possible hazard. There are a great many fractures of the lower extremities that need only coaptation for emergency

splinting. The constant air pressure, however, produces in itself a certain amount (or degree) of traction by reason of a downward push against the prominences of the extremity. This has been called auto traction. The combination of a compound fracture and a burn indicates its use. The continuous pressure exerted would be helpful in the management of both conditions, and the lessened edema at the fracture and burn sites aids in

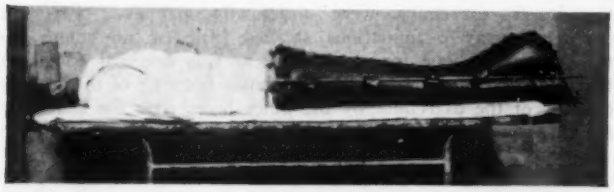

Fig. 8.—Same as figure 6, side view.

reducing secondary shock tendency, retarding absorption of the products of tissue trauma. The buoyancy afforded suggests its use as an emergency splint for a sailor with a fractured leg who has to abandon ship (fig. 10). By holding the arms outstretched and the free extremity next to the splinted one, the wearer easily remained afloat on his back with little or no tendency to listing.

Compressed air between layers of rubber or supporting material for splinting purposes is not new. However, the literature contains no available information regarding its use for treatment of fractured extremities, emergency or otherwise.

R. C. Wingfield [1] designed a pneumatic apparatus which was made of different sizes and used as a restrictor of chest

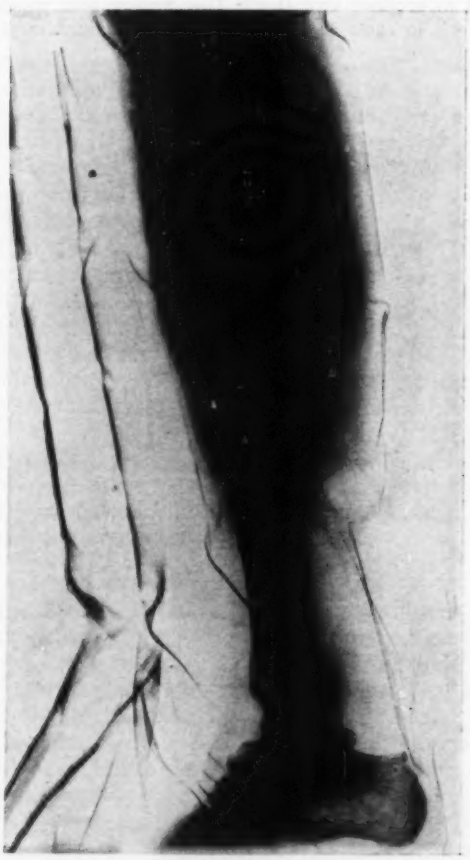

Fig. 9.—Same as figure 8, lateral view.

movement in pulmonary tuberculosis and thus aided in promoting fibrosis and healing. This preceded artificial pneumothorax. George Robertson and Ruth Millar [2] made hollow pneumatic rings of 1½ inches inside diameter strengthened with cord and covered with stockinet to be used as pressure pads inside a box splint. These were substituted for the "birds' nests" formerly used, eliminating ulceration and irritation frequently found beneath the heel. The stockinget eliminated the sweat hazard. Several were used in each case. Douglas Beverly,[3] in discussing the local treatment of burns, describes a compression dressing called "the transparent jacket system." This is a transparent compartment with walls made of light material, having an intake and an outlet valve. While the pressure is continuous, it may be controlled in amount. The burned surface can be seen at all times. It is also used as a pressure dressing for immobilization of skin grafts.

SUMMARY

A pneumatic leg splint has been successfully used many times in lower extremity fractures.

It may be combined with a Thomas splint, especially indicated in femoral fractures.

It is consistently comfortable.

There is minimal edema at the fracture site.

Pressure is low, constant and evenly distributed.

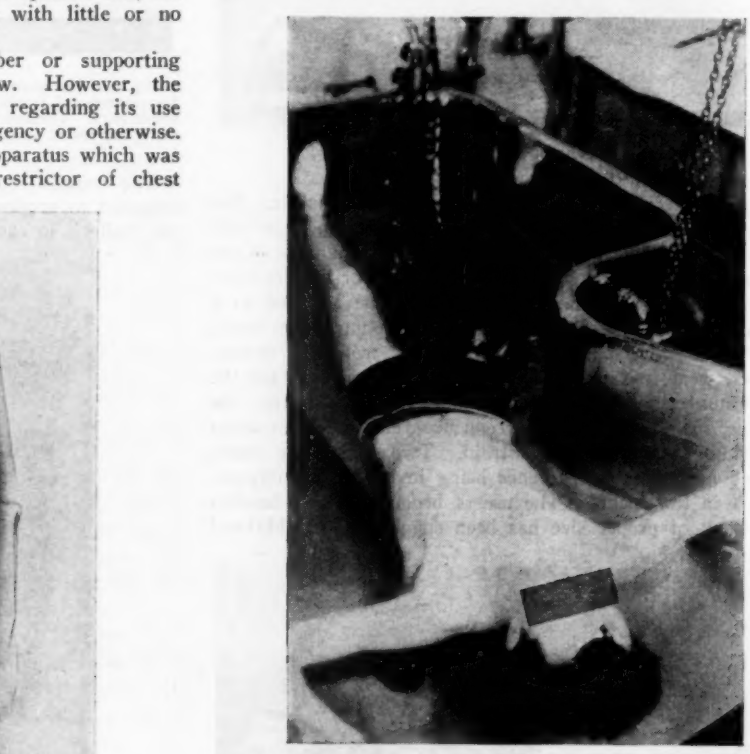

Fig. 10.—The pneumatic leg splint in place on a right lower extremity, showing buoyancy in water. There were 20 inches of water in the Hubbard tank. By keeping the arms slightly outstretched, the patient's head and trunk remained up. There was a slight list to the unaffected side. This was controlled by changing position of the unaffected extremity. Application of a Mae West life jacket would obviously be an additional safety factor.

It is quickly and easily applied.

It is recommended only as an emergency and transportation unit.

It can be used as a pressure dressing for complicating lower extremity burns.

It floats.

It may be useful as an added piece of fracture equipment, aboard ambulances, emergency hospital services and in the surgical divisions of the armed forces.

Experimental work continues.

Arrangements are being made for the commercial supply of the unit under patent protection.

1. Wingfield, R. C.: A Lung Splint, Lancet **1**: 17, 1926.
2. Robertson, G., and Millar, R. E.: A New Pneumatic Splint Pad, Lancet **2**: 508, 1927.
3. Beverly, D.: The Treatment of Burns and Other Extensive Wounds with Special Emphasis on the Transparent Jacket System, Surgery **15**: 96, 1944.

Council on Industrial Health and Council on Pharmacy and Chemistry

Many hundreds of articles have been published on the treatment of burns. Some of these have been excellent reviews, but frequently they were published in periodicals not available to the majority of the medical profession, were out of date almost as soon as prepared, or emphasized some aspect of treatment which later was disputed warmly. Other communications presented information in an orderly and concise fashion which made them almost necessary additions to every medical library. One such book that has been well received is Burns, Shock, Wound Healing and Vascular Injuries, prepared under the auspices of the Committee on Surgery of the Division of Medical Sciences of the National Research Council (1943).

Nevertheless, many letters arrive at the office of the Council on Industrial Health and the Council on Pharmacy and Chemistry asking for information on the treatment of burns. These letters indicate the need for a status review which will present in digest form pertinent facts relating to the various methods now commonly employed to treat burns. The following review is offered for this express purpose. It is not for the specialist but for the general practitioner and the industrial physician. It is hoped that the report will show that the ideal agent has not been developed, that highly complex mixtures are as irrational for this form of treatment as for others, that each new highly publicized treatment or drug should be studied with a critical eye before accepting the accompanying claims, that the best treatment on the whole is the simplest and that any treatment is a tedious and painstaking undertaking. On many occasions the Council on Pharmacy and Chemistry has been asked to consider some proprietary drug or mixture proposed for the treatment of burns with an astounding array of claims. With few exceptions the claims have far exceeded the therapeutic value, and not infrequently the agent sooner or later has sunk into obscurity. A complete bibliography for this report will be included in the reprints.

Carl M. Petersen, M.D., Secretary.
Council on Industrial Health.

Austin E. Smith, M.D., Secretary.
Council on Pharmacy and Chemistry.

LOCAL TREATMENT OF THERMAL CUTANEOUS BURNS

Over one thousand papers dealing with burns have been listed in the *Quarterly Cumulative Index Medicus* during the past decade, and the number is increasing rapidly under the stimulus of the high incidence of thermal burns in the present war. Some two hundred articles largely concerned with local treatment alone have appeared in the last few years (Harkins [1] listed seventy-five different preparations which have been proposed for local burn therapy). Examination of these reports supports the belief expressed by many authors that there is at present no single preparation or method of therapy which will meet the needs of every case or solve all the problems involved in the treatment of a burned area.[2] However, some of the more widely used local methods may give acceptable results if properly applied and if the systemic treatment of the patient is adequate.[3] Bettman,[4] Bunyan,[5] Harkins,[6] Lavender,[7] Aldrich,[8] Wakeley,[9] Allen and Koch [10] and Atkins,[11] to name only a few, have reported excellent results on large series of patients while employing widely varying local measures of treatment. The only factor common to the procedures used by each of these authors, other than systemic treatment, was thorough but gentle cleansing of the burned area under rigidly aseptic precautions.

Local treatment of burns is in a state of flux, which is apparent to all who are familiar with the subject. The unsatisfactory results obtained with some of the older methods of treatment have led to considerable experimentation. In spite of the voluminous literature and the many reviews of the local methods of burn treatment,[12] the lack of careful comparative study of these measures leaves a place for a definitive statement of the effects which local treatment seeks to produce and the results which may be expected from the application of the more widely used methods.

It is not the function of this report to discuss the systemic treatment of burns, the aim of which it is agreed is the return to a normal physiologic state. The direction and degree of such alterations can now be determined and the means for producing the necessary corrections are generally known.[13] The office of the Surgeon General [14] issued a circular letter for the treatment of burns in the Army. It outlined the prevention and the treatment of shock, the administration of adequate amounts of morphine and the intravenous infusion of plasma, prophylactic chemotherapy, prophylaxis against tetanus and possibly gas bacillus infection and local treatment.

Later the Medical Division of the Office of Civilian Defense [15] announced a revision of the pamphlet "Treatment of Burns and Prevention of Wound Infections" to incorporate new technics and to recognize directions of the Committee on Chemotherapeutic and Other Agents and the Subcommittee on Burns of the Committee on Surgery of the Division of Medical Sciences of the National Research Council. The most notable change in the pamphlet is the withdrawal of the recommendation of the use of ointments or jellies containing tannic acid in the first aid treatment of burns. The pamphlet describes "open" and "closed" treatment for burns. The "open" treatment, apparently the treatment of choice, consists essentially of the application of boric acid ointment or petrolatum, with pressure dressings. (More recently, boric acid has been criticized because of its toxic properties.) The "closed" treatment (tanning or eschar method) is recommended only if not more than twenty-four hours has elapsed, if the burned area has not been grossly contaminated, if strict surgical asepsis is employed and if coagulation is readily accomplished.

The liberal administration of oxygen also has been advocated.[16] Few surgeons will proceed with more than preliminary care of the burned area before shock is controlled. The following discussion of local treatment is made with the assumption that the probably greater importance of proper systemic treatment is recognized and that such treatment will be carried out.

The usual classification of burns as to depth has been heeded in this report. First degree burns include only those which involve the most superficial layers of the skin and produce simple erythema. Second degree burns produce blistering and may be of varying depth but always leave intact some elements of the skin, providing islands of epithelium from which regeneration can occur. In third degree burns the full thickness of the skin is lost, and these always require skin grafting for rapid healing of even moderately sized areas. The latter group includes the deeper burns (grades 4, 5 and 6, Dupuytren).

Obviously a discussion of the proper time and methods to be used for grafting deep burns has no place in a review such as this and is omitted. Subsequent discussion on treatment is limited to the medicinal preparations more commonly employed at this time.

TANNIC ACID

Tannic acid was introduced by Davidson [17] primarily to fix and prevent the absorption of toxic substances from the burned area. Many authorities today are not willing to admit that this fixing action of tannic acid is responsible for any effectiveness in reducing the mortality rate of severe burns, and a wave of disapprobation has followed the use of this substance in the present war.[18] Probably the first denial that tannic acid has reduced the mortality rate in burns came from Stanley J. Seeger, based on statistical material from Milwaukee Children's Hospital. However, the benefits which may have followed its use and the reasons for its failures should be examined critically in view of its past popularity. It has been stated frequently that an escharotic produces the following effects by sealing over a properly prepared burned surface:

1. Lightens shock by lessening or abolishing pain and the external loss of plasma.
2. By forming an impervious covering, prevents the invasion of bacteria and thereby secondary infection.
3. By forming a painless, tough dressing which does not require frequent changing, makes the patient comfortable, decreases nursing care and allows for ready transportation.
4. By fixing "burn toxins," if any, prevents their absorption and consequent systemic effects.
5. Lends itself to the adequate handling of large numbers of casualties.

Despite the beneficial effects, it must be admitted that tannic acid has its disadvantages, and some unfortunate experiences have followed its use. Those most commonly reported in the literature are the following:

1. The eschar develops slowly and requires frequent applications, thus allowing considerable pain and external plasma loss and requiring the time of a comparatively large nursing staff during the first twenty-four hours.

2. The eschar formed is thick, inflexible and unyielding. On circumferential burns and over the pulps of the fingers it tends to produce ischemic and pressure necrosis. Over joints it tends to crack or, by prolonged immobilization (especially of the fingers) to produce fixation. It tends to curl at the edges; this curling and the formation of multiple cracks allows openings for secondary invaders. On the face it produces unpleasant immobility and by contracting tends to distort yielding structures. Ectropion often follows the use of tannic acid on burns of the eyelids.

3. Near body orifices, especially on the perineum, its integrity cannot be maintained and infection supervenes.

4. Infection once started spreads rapidly and the focus of infection is not readily found under the thick, rigid eschar. Many workers feel that it is impossible to prevent infection from developing beneath the eschar, especially in third degree burns. If infection develops, most surgeons agree that the eschar should be removed, a painful procedure.

5. Remaining islets of epithelium may be destroyed by the fixing action of tannic acid or the surgery which may be required to remove the eschar. Tannic acid has been reported to cause liver cell necrosis.

6. If third degree burns are treated with tannic acid a proper eschar is difficult to produce. Once formed, the eschar delays sloughing of devitalized tissue, the formation of healthy granulation tissue and the preparation of the wound for grafting. Further, the formation of an eschar over deep burns provides an ideal environment for the development of infection in areas where antiseptics and the escharotic cannot reach.

7. Tannic acid is said to be capable of causing liver damage.

In reviewing the literature with the aforementioned factors in mind there is almost complete unanimity on certain points. Thus, while Atkins [11] and Ogilvie [19] report that if done properly tanning of the hands produces no further damage, it is generally agreed that tannic acid should not be used on the face, hands, feet or surfaces near body orifices where contamination is probable (perineum, genitalia [20]). If circumferential burns of the extremities are tanned, the limb must be constantly watched for interference with the distal circulation,[21] and preferably the tan should be split lengthwise to allow for the development of edema.[22] Great care must be used to prevent permanent fixation of joints involved in the eschar.[23] Although immobilization to insure rest of a limb is widely recommended,[24] it may be considered safest not to use tannic acid on areas which will be immobilized in a constricting shell if an escharotic is used.

Other than shock, the most common complication of a burn is secondary infection.[25] Although a fresh burn has been said by some to be made sterile by the action of the causative agent, in practice all burns may be regarded as contaminated.[26] Moorhead's dictum "A burn is an infected wound due to heat" [27] warrants consideration. It is a common saying that tanning a burn without proper cleansing and débridement is akin to primary closure of an infected wound.[23] It follows that an essential preliminary to the application of tannic acid or any other escharotic is the careful cleansing of the burned area and the most thorough débridement practical under the most rigidly aseptic conditions. [28] The necessity for careful masking of the surgical team has been emphasized again and again.[29] There should be no compromise in this regard. The surgeon who has charge of a burned patient has a responsibility which can be fulfilled only by the application of much care and a great deal of hard work. There are two exceptions to the rule of the earliest possible (after control of shock) complete aseptic preparation of the burned area: in extensive burns when the immediate danger to life is great a local application may be life saving,[6] and when there are a large number of victims thorough preparation may be impossible.[30] In each of these conditions the surgeon's responsibility has not ended with the local application. A complete preparation should be done as soon as possible. Many of the infections occurring under a tannic acid eschar may be due to lack of attention to the proved surgical principle: adequate preparation of a contaminated wound before primary closure.[31] Harkins's "principle of time" is important. Harkins has stated that tannic acid should never be applied after twenty-four hours without due reason. Todd [32] considers any burn older than twelve hours to be infected and treats it as such.

Most investigators of burn therapy prefer to clean and debride the affected area under an anesthetic.[33] Because of its convenience, intravenous anesthesia was hopefully tried,[34] but the results were not promising.[35] Gas and ether are preferred.[36] If suitable apparatus and a skilled anesthetist are not available, open drop ether is recommended.[37] Some assert that no anesthetic should be used if possible.[38] Koch states that morphine analgesia is sufficient if the preparation is gently done.[10] Vigorous scrubbing and harsh cleansing agents are generally frowned on.[39]

The after-care of the tan is vitally important in guarding against infection.[40] Bacteria find entrance from the edges and through cracks in the eschar.[41] The daily painting of these ports of entry with 1 per cent gentian violet [42] or Aldrich's [43] triple dye mixture, or dusting with sulfanilamide powder [19] has met with some approval. Daily rigorous inspection of the tan is essential.[44] If infection occurs the tan over the area may be removed [45] by moist saline packs or baths or by surgery, the infected area cleaned with warm saline solution, sodium hypochlorite or Dakin's solution,[46] and treated with sulfanilamide powder and warm saline soaks [47] or with the aniline dyes.[48] In this and all subsequent discussion "saline solution" will be taken to mean "isotonic solution of sodium chloride."

Third degree burns heal naturally by the sloughing of devitalized tissue, the formation of granulation tissue and the growth of epithelium from the edges, a long, inefficient process. Such healing is said to be greatly hastened by surgical care which involves the judicious removal of dead tissue,[49] prevention of infection and the earliest possible skin grafting of all third degree burns. Covering such wounds with an eschar hinders this program, and many authorities are of the opinion that an escharotic should never be used on third degree burns.[50] Immediate excision and grafting of localized deep burns has been advocated,[51] and there appears to be evidence to recommend this action. It is, however, often difficult to distinguish with certainty the depth of a burn before several days have passed.[52] At present, if an escharotic is to be used no distinction should be made as to the depth of the burn unless full destruction of the skin can be definitely ascertained.[53] Even then, in certain cases the application of an escharotic over deep burns of broad surfaces may be justified as a life saving measure.[54]

That the production of the eschar with tannic acid is a slow process and that the eschar formed is thick, constricting and inflexible cannot be denied.[55] Several modifications have been prepared to overcome this difficulty. A stronger (20 per cent) solution of tannic acid has been claimed to produce a satisfactory eschar much more rapidly than the usual (5 to 10 per cent) concentration.[56] Bettman [4] proposed that following the initial application of 5 per cent tannic acid the area be painted with a 10 per cent silver nitrate solution. This procedure is said to produce quickly a thin, pliable, tough eschar and it has been widely used.[57] A further modification in which the first application was a 1 per cent gentian violet solution followed by tannic acid (9 per cent) and silver nitrate (10 per cent) has been advocated.[58] The eschar formed was similar to that produced by Bettman's procedure. The gentian violet apparently served entirely as a preliminary antiseptic treatment of the burned area. Because of the rapidity with which the eschars are formed and their thinner, more flexible, nature these last two methods seem to offer advantages over 5 per cent tannic acid. Still another modification was reported by Richards.[59] He advocated an alcoholic solution of tannic acid which was said to produce a thin eschar rapidly while at the same time the alcoholic menstruum acted as an anti-

septic application. The discussion of the necessity of thorough preliminary cleansing and the principles of site and time apply [6] for these procedures just as much as for tannic acid alone.

Tannic acid is reported to fix and destroy remaining islands of epithelium,[60] although this action has not been proved beyond dispute. It has not been demonstrated that this effect can convert a deep second degree to a third degree burn, as can infection.[61]

A good portion of the case built up by Wells, Humphrey and Coll [62] for tannic acid as a liver poison when applied to burned areas rested on the observation that prior to the widespread use of this substance liver lesions had not been recognized in fatal burn cases. Boyce [63] contradicted this assumption; Wolff, Elkinton and Rhoads [64] and others [65] have shown that liver changes and decreased function occurred in burns per se. However, Wells and his co-workers proved by intravenous injection that tannic acid, if it reaches the liver, can produce definite destruction of liver cells. The importance of this fact merits further investigation.

ANILINE DYES

Aldrich [66] introduced the use of gentian violet and later a mixture of three dyes (gentian violet, brilliant green and acriflavine) [8] on the theory that burn "toxemia" was due to the invasion of bacteria. Aldrich's theory of the etiology of the acute toxemia of burns has not been generally accepted, although the agents he introduced and his outline of treatment [67] retain their utility. The dyes when applied in a 1 per cent solution or as a jelly produced a tough, thin, flexible eschar which developed slowly. It was said that they did not destroy remaining islands of epithelium and that they did not cause liver damage. Since the dyes are fixative agents it is possible that they are not completely harmless to damaged epithelial cells.[68] Both preparations possess considerable bacteriostatic and bactericidal power against gram positive organisms, and the mixture of three dyes against gram negative organisms as well.[69] This property may be considered a useful adjunct in the preparation of an aseptic surface prior to the application of the escharotic, much as the gentian violet, tannic acid and silver nitrate procedure just discussed. Eschars produced by these or any other tanning agents have not been shown to have any bactericidal or bacteriostatic action. It has been often overlooked that infection can readily occur under eschars produced by these agents.[70] Thorough preliminary cleansing under rigid aseptic technic should be considered when these dyes are used, as when any of the variants of tannic acid therapy are employed.[71] The advantage was claimed that local areas of infection and suppuration could be detected early under a dye eschar, since its presence was betrayed by softening.[72] This would be helpful, but constant daily surveillance remains a necessity if the spread of infection is to be avoided.[72] Since the application of the dyes produces an eschar, the same limitations apply to their use as to tannic acid; this applies to the face, hands, feet and on surfaces near body orifices. Extreme care should be employed when they are used on circumferential burns of the extremities or over joints. While some workers accept their use on the hands and face,[73] others do not. Most tanning agents can be used to build up an eschar of any desired thickness, depending on the concentration of the solution and the number of applications; the aniline dyes are no exception.[74] Disadvantages lie in the slowness with which the eschar develops and in the messiness of the treatment. Branch,[75] combining the use of gentian violet with silver nitrate, reduced the time required for eschar formation. This method would seem to compare with the tannic acid-silver nitrate technic of Bettman.

Brilliant green has been used alone in the same manner as gentian violet. The results were said to be promising, although no data were given.[76]

SULFADIAZINE SPRAY

Pickrell [77] reported that a solution of sulfadiazine in 8 per cent ethanolamine when sprayed over a burned surface produced a thin, transparent, flexible eschar. The entire application required four days, and it has been stated [78] that the tan produced was so thin that second degree burns were painful and the transportation of all types of burns difficult. Nevertheless, several authors appear enthusiastic over this treatment.[79] Comments have been made on the procedure advocated by Pickrell of spraying the solution over the burned area with no preliminary cleansing.[80] The absorption of sulfadiazine has been reported to cease after the eschar is formed; [81] extensive use of sulfadiazine, however, should be accompanied by the same precautionary observations as when sulfadiazine is administered orally. The method has not been reported on sufficiently for final judgment to be made. It shows promise and seems worthy of trial, although the slowness with which the eschar develops is a serious disadvantage. Preliminary cleansing should not be omitted if at all practical.[82]

SALINE BATHS

The unpleasant results following the use of tannic acid on extensive third degree burns and on burns of the hands led to a trial of warm saline baths as a method for the treatment of burns.[83] Good results were reported. Sloughing of devitalized tissue and the control of infection were promoted, while the rapid preparation of granulating surfaces for grafting and the ability to maintain active movements were noted. External loss of plasma was not decreased, and the frequent changes of dressings were apt to be painful. A considerable amount of apparatus and much nursing care were required. The method will not adapt itself to many hospitals or to the handling of large numbers of patients. Transportation of such patients is not practical. Notwithstanding these difficulties, the method may have an application in selected cases, as in infected burns. Between baths the area may be sprinkled with sulfanilamide and kept moist with warm saline packs. The application of this procedure to infected and special areas such as the hands has proved valuable.[84]

An alternative and similar method utilized the application of tulle gras or similar dressing and moist saline dressings after first cleansing the area and sprinkling with sulfanilamide.[85]

The outer dressings were changed frequently but the tulle gras was left in place, obviating the pain attendant on a complete change of dressings. These methods were especially useful for infected or grossly contaminated burns or burns of the hands, feet, face and perineum.

OILED SILK (BUNYAN) ENVELOP

Bunyan [5] sought a method which would aid the healing of burns by gentle but thorough cleansing and by the removal of dead tissue while avoiding irritant applications. The dressing desired should be painless and allow active and passive movements. The treatment should not aggravate burn shock but diminish or inhibit loss of body fluid, reduce absorption of toxins and disinfect without further damaging tissues.

He believed that the closest approach to this ideal involved the use of electrolytic sodium hypochlorite (in the form of "milton," a 1 per cent solution), which was said to be nontoxic, antiseptic and stimulating to growth but destructive to dead tissue. The preliminary cleansing was done with a 10 to 20 per cent solution of the original preparation. The wound was irrigated three times daily with a 5 per cent (or less) concentration. To form a painless, airtight dressing within which the frequent washings could be carried out, oiled silk envelops were devised and fitted with inlet and outlet tubes through which the solution could be passed. It is not generally recognized that the oiled silk envelop formed a dressing analogous to an eschar, with the same effect of relieving pain, avoiding frequent changes of dressing and allowing ready transportation. The oiled silk was said not to stick to the burned area, was easy to apply and, being transparent, allowed inspection of the wound at all times. The method aided sloughing of devitalized tissue, exerted a continued cleansing action and minimized or prevented infection in every way analogous to a continuous bath with the added advantage of a sealing, sterile, painless dressing. The envelops in reality formed a local bath. The irrigating solution employed may be isotonic solution of sodium chloride, a solution of one of the sulfonamides, or Dakin's solution instead of the solution of electrolytic sodium hypochlorite.[53] Bunyan [5] reported that saline solution caused maceration of the tissues, which the sodium hypochlorite solution did not. Some pain may be experienced if the irrigating solution is too strong, and the tight seal may increase the

edema of the enclosed portion.[86] The method has proved useful for isolated areas such as the hands, feet and limbs and requires simple yet specialized apparatus. It is not labor saving when only 1 or 2 patients are treated but is said to reduce considerably the nursing care of a full ward. The method remains to be more adequately tested, especially for extensive burns. If the equipment is available it would seem to be a valuable means of treating deep, grossly contaminated or infected burns, especially of the hands, feet and limbs.[87] The irrigating solution may be changed at any time to meet the demands of the wound or the wishes of the surgeon.

PRESSURE DRESSINGS

The method of pressure dressings, so ably presented by Allen and Koch,[10] has been termed the "physiological" [88] and "surgical" [89] method by other writers. It was devised in an effort to follow well founded surgical principles and to violate none of the physiologic factors which govern the healing of any wound. Essentially it consisted of thorough cleansing and débridement, preferably without an anesthetic, after which the wound was covered with petrolatum gauze and a pressure dressing applied to inhibit both internal and external plasma loss. Immobilization of the affected part for twelve to fourteen days was enforced. During this period the dressings were not changed without due cause. Good results have been recorded.[90] It is imperative that all who follow Koch's regimen should follow it in detail. Thorough study of the writings of Allen and Koch [10] and of Siler [91] is a necessity. Although the method has been criticized as unpractical for handling large numbers of casualties,[92] this point apparently remains to be settled.

Variants of the method have been used. Zeiss [93] reported on a revival of the paraffin dressing used widely prior to the introduction of tannic acid. His method is similar to that of Koch except that the dressing, built up with paraffin and constituting a pressure bandage,[94] is changed daily. While this frequent dressing was criticized,[95] it was pointed out that the burns on which the method was used were deep, the daily dressing was not painful, it allowed constant inspection and sloughing tissue could be trimmed away.

There has recently been advocated in England an adaptation of the Trueta and Orr closed plaster technics to burns.[96] Such immobilization was earlier used by Lohr.[97] It does not constitute a pressure bandage and, while it may be of some advantage in the late treatment of debilitated patients with burns of the extremities,[98] it has not yet proved its worth as a routine measure.

GROWTH STIMULATING PREPARATIONS

Innumerable preparations have been developed and proposed for the treatment of burns because of their claimed "growth stimulating" properties. The active ingredients comprise a large and expanding group, including such substances as cod liver oil, various vitamins and hormones, allantoin, urea, sulfhydryl bearing compounds, cell extracts and the as yet undefined "wound hormones." It is not the function of this article to discuss the extremely complex factors which govern the healing of wounds or the alleged growth stimulating properties of various agents. It should suffice to point out that wound repair is an intricate subject depending on many factors. Observations on the time of healing of wounds with any such factors uncontrolled are not conclusive. Not one of the proposed preparations has been generally accepted by those who are authorities in this field. Those interested in the subject or who desire to make growth stimulating claims for any substance should read carefully such articles as that of Young, Fisher and Young.[99] These authors point out the common error of basing claims on insignificant data without respect to the biologic variations which count so much in the healing of a wound. In certain cases, as in burns in the "indolent stage," stimulating dressings could be of value but, when healing is proceeding at the usual rate, it is questionable whether the use of such preparations is rational. The situation would seem to be analogous to the administration of vitamin C to a person already adequately supplied. Finally, no preparation, no matter how potent in growth stimulating properties, can stimulate epithelial regeneration when the full thickness of the skin is destroyed. Such growth must occur from the edges of the wound. No dressing can substitute for early and adequate skin grafting in third degree burns.

MISCELLANEOUS

Certain highly complex preparations have been formulated for use on burns. Several writers have reported excellent results following their use when the systemic needs of the patient were met.[100] It is doubtful if better results were obtained in these cases than if simpler preparations had been used. The employment of irrational mixtures is at variance with the modern concept of any form of therapy and the Council on Pharmacy and Chemistry has issued many reports on the use of such mixtures.

Mercurochrome has been proposed as an antiseptic escharotic.[101] It was said to produce quickly a thin, tough eschar and at the same time aid in the preparation of the burned area. It has one insurmountable objection: absorption from the burned area may be great. Several instances of mercury poisoning have followed its use in this manner,[102] and it probably should never be employed on burns.[103]

Various substances dissolved or suspended in an alcoholic menstruum have been suggested.[104] Whatever the character or advantages of the use of the active principle, the application of strongly alcoholic solutions to raw areas is to be condemned. The pain attendant on such use could be of a shocking nature.

A variety of ointments and oily dressings, usually containing a bacteriostatic agent, also have been proposed for use in deep burns and burns of the hands and face, always under a sterile dressing.[105]

THE USE OF SULFONAMIDES IN BURN THERAPY

That the sulfonamides should be used in the treatment of burns was inevitable, for the ever present danger of infection made their trial necessary. Their value seems assured,[106] but the procedure by which they are best used has not been established. Sulfadiazine spray has already been discussed. Powders have caused mechanical difficulties (caking) and have not been ideal for sprinkling over extensive weeping wounds.[107] Further, the size of the raw area could in certain instances allow massive absorption.[108] More recently, however, there have been attempts to vary the size of the sulfonamide particles and more success in this technic may result.

Various dosage forms have been advocated. A dispersion in a water soluble jelly was proposed for use on the hands, face and genitalia and as a first aid application.[14] Robson and Wallace [109] recommended a complex glycerin-sulfonamide paste. Heggie, Gerrard and Heggie [110] reported a number of sulfonamide emulsions. Sulfanilamide has been incorporated into a tannic acid jelly [111] and mixed with liquid petrolatum.[112] Allen and his co-workers [113] believed a sulfathiazole ointment using a water in oil base to be of value. They advocated its use in the pressure dressing procedure of Koch in place of petrolatum. Colebrook [114] proposed sprinkling sulfanilamide over the burned area and covering it with petrolatum gauze and warm saline dressings. The use of dry sulfonamides as a local measure with saline baths or hot wet dressings and the "tulle gras" procedure has been reported.

Not one of these methods for local application has supplanted in full the procedures discussed elsewhere in this report. The choice depends on individual experience and preference and adaptability to the local measures used. When used locally as a powder, sulfanilamide is preferred by many,[115] while sulfathiazole and sulfadiazine jellies and ointments have their advocates.[116] The only one to be reported as forming an eschar is sulfadiazine.[77] Regardless of these reports, more recent observations have shown that the ideal ointment or emulsion has yet to be devised. If these drugs are used locally, especially in such wide, denuded areas as occur in burns, the same precautions must be taken as are followed when the drugs are given by mouth. The blood picture and urine output are to be followed routinely.

Some investigators have advocated the routine use of one of the sulfonamides by mouth in all burn cases.[117] While there might seem to be some advantages accruing from this procedure, it has been criticized on the basis that nausea and

vomiting are frequent and would further add to the hemoconcentration now recognized to occur in burns.[118] Further, these drugs may aggravate or precipitate real or incipient liver damage.[119] If oral administration is ordered, sulfadiazine and sulfathiazole have been the drugs of choice.[120]

FIRST AID

If only reddening of the skin has resulted from the burn and the superficial (first degree) nature of the lesion can be definitely ascertained, the application of a soothing ointment may be allowed.[121] When blistering or tissue destruction have occurred and hospital facilities are close at hand, most authorities are agreed that no local medication other than a covering of sterile dressings should be applied or, lacking that, a clean cloth of any nature.[122]

If the burn is extensive (which some have estimated as 20 per cent of the body surface), anti-shock treatment is imperative and should include the administration of morphine and an avoidance of everything which might cause fluid or plasma loss or exudation. If hospital admission is delayed, the first intravenous plasma (solution of crystalloid substances such as dextrose or sodium chloride may be actually harmful) should be begun if at all practical;[123] 500 cc. may be given without waiting for blood studies. Greasy applications are avoided by many on the grounds that they produce only moderate alleviation of pain (a function better performed by morphine) and add to the difficulties of properly cleansing the burned area.[124] Oils and greases make necessary vigorous handling and the use of fat solvents, procedures which may precipitate or increase shock. Further, the presence of grease makes difficult the formation of an eschar. On receiving an emergency call the physician may advantageously warn his informant or the victim's helpful neighbors to put nothing on the wound before his arrival and, on learning of the severity of the case, have the hospital informed that an emergency room will be urgently needed.

If the patient cannot be transferred to a hospital for several hours (twelve to twenty-four) some form of local dressing may be necessary. Such dressings should aim at preventing external loss of fluid, relieving pain and preventing further contamination. Whatever the individual preference for local applications, shock treatment is even more imperative under these conditions than if a hospital is readily available.

SUMMARY AND CONCLUSIONS

A review of the literature brings out two basic principles which serve as guides to the proper local care of a burn. First, properly applied, many of the more established local measures may give good results if the systemic care of the patient is adequate. Second, gentle cleansing and no unnecessary débridement of the burned area is essential for the successful application of any of the local methods of burn therapy. Under certain conditions, as a life saving measure or the necessity of handling large numbers of cases in a short time, the preliminary cleansing may have to be shortened. If infections occur, prolonged healing time and poor functional results may ensue.

A pronounced change in medical opinion regarding the use of tannic acid and other tanning agents has become apparent. The possibility of disastrous results following the formation of an eschar should always be kept in mind when the burn area is on the face, hands or genitalia. If escharotics are used, those producing a thin, tough, flexible eschar rapidly are preferred by some, although those producing similar eschars more slowly may possess certain advantages, which will result in their selection in many cases.

For those areas where an escharotic is contraindicated, or for infected burns, a number of variations of the saline bath are available. Of these, the continuous saline bath, the Bunyan envelop and the tulle gras dressing have their advocates. They are usually used with the local application of a bacteriostatic agent, as one of the sulfonamides, electrolytic sodium hypochlorite or Dakin's solution.

The use of the pressure dressing as advocated by Koch reveals interesting possibilities and its use has become very popular.

The use of growth stimulating agents has not been adequately studied, and much work remains to be done in this field. None have been accepted by the Council on Pharmacy and Chemistry.

The widespread use of the sulfonamides, both locally and orally, marks a definite trend in the treatment of burns; they offer promise for the prevention and treatment of infection. However, prolonged use of these agents may cause sensitization. This is a danger that should be kept in mind by all physicians. In concluding this discussion it is well to point out that no method which has been presented to date makes the proper care of burns anything but a tedious and time consuming procedure, the results of which are frequently disappointing. The alternatives are clear: high mortality and morbidity, loss of function and disfiguration for the patient. The responsibility of any individual or group attending a burned patient is obvious. Further, one of the commonest errors in the treatment of burns is underestimating the extent and seriousness. All burns should be regarded as potentially serious wounds.

In no instance should local treatment replace the prevention and treatment of shock, prophylaxis against tetanus and possibly gas bacillus infections and proper surgical procedures when indicated.

The comparative evaluation of the various treatments proposed for burns would be made more accurate if proper records always were kept and published. Boyce[63] has stressed the inadequacy of most records. Harkins[6] has posed four pertinent problems: 1. What is the longest possible interval after a burn that tanning therapy can be applied under optimum conditions? 2. What percentage of plasma loss does tanning prevent? 3. Assuming that the main purpose of the tanning method is to conserve plasma, if plenty of plasma is available, is tanning still advisable? 4. Is tannic acid toxic? At least one other may be proposed:[125] What is the best means of hastening the sloughing stage of deep burns, promote maximum healing and still prevent infection? Similar questions proposed by many authorities emphasize that more critical observations, well documented and controlled, are needed. In reporting results care should be taken to record the site, extent and depth of the burn, the incidence, degree and location of infection, the physiologic state of the patient as indicated by blood and urine studies and kidney and liver function tests, the nutritional state of the patient and his age. The effectiveness of newer antiseptic agents and their effect on the patient should be determined. Statistical evaluation would be desirable, and the utilization of proper controls should not be forgotten in investigational work.

ADDENDUM

Since the Councils' report was prepared, many other papers have appeared in print. Some of them represent much work and critical evaluation. For example, Drs. Roy D. McClure and Conrad R. Lam have offered a study of a survey representing the burns occurring in a group of approximately 250,000 industrial workers. After examining the data for tannic acid, greasy ointments, vitamin ointments and sulfonamide ointments they concluded that there were an unreasonable number of different preparations being used for the treatment of minor burns in industrial plants and that the average minor industrial burn is apt to be healed in less than a week. They suggested washing with white soap and water, no breaking of blisters or other debriding, a cover of fine mesh gauze impregnated with petrolatum or 5 per cent boric acid ointment and a firm dressing of sufficient size to keep away dirt.

More recently, there appeared in THE JOURNAL (June 24, July 1, 1944) a symposium of seven papers published under the auspices of the Section on Surgery, General and Abdominal. The authors discussed the problem of thermal burns, the chemical aspects of burn treatment, the general care of the burned patient, the present status of the tannic acid method in the treatment of burns, surgical cleanliness, compression and rest as primary surgical principles in the treatment of burns, the early plastic care of deep burns and the late plastic care of burn scars and deformities.

After a consideration of the other papers made available more recently, the Councils declared there was no need to change the report. In fact, most of the more critical presentations tend to support the principles set forth in this joint statement.

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SATURDAY, AUGUST 5, 1944

ESSENTIALITY OF AMINO ACIDS

Not long after the demonstration, on the basis of chemical analysis, that some proteins fail to provide certain amino acids, nutritional studies with experimental animals established that growth, maintenance and physiologic well being cannot be attained unless certain amino acids are available to the animal. Indeed, the work of Hopkins and of Osborne and Mendel in this connection served to turn attention from the importance of the quantity of protein in the diet to a consideration of the biologic significance of the quality of the food proteins as regards their amino acid content. The brilliant work of Rose and his callaborators at the University of Illinois has served not only to expand the number of amino acids recognized as indispensable for adequate nutrition but also to clarify the general concept of the nutritional significance of amino acids. At present it is generally accepted that there are ten amino acids essential for the growth of the young white rat, the laboratory test animal most widely used for this type of study, and satisfactory growth over a limited span of the early life of these animals has been observed when these ten amino acids represent the main source of nitrogen in the experimental diet. However, Lewis [1] has cautioned lest the attitude prevail that protein nutrition in general can henceforth be satisfied with only the recognized essential amino acids or that the rest of the protein molecule is nutritionally of little importance.

On the basis of recent investigation, certain factors appear to be important in influencing the essentiality of the amino acids. The age of the experimental animal is one of these. Whereas arginine is needed preformed in the diet of a young rat, Scull and Rosé [2] have shown that the adult animal of this species can synthesize this amino acid rapidly enough for maintenance needs. Again, on the basis of balance experiments it has been indicated [3] that fewer of the "essential" amino acids are needed for maintenance of adults than for growth of young rats. There arises the question as to whether different species of animals have different needs for amino acid. It has been shown [4] that aminoacetic acid is required by the chick, whereas the mammal appears to be able to synthesize this amino acid with ease. Furthermore, using the maintenance of nitrogen balance as the criterion of indispensability, Rose and his associates [5] have demonstrated that histidine, essential for growth of rats, is not needed by human subjects.

Another factor which must be considered in the metabolism of substances administered by mouth is the activity of intestinal bacteria. A recent observation by Martin [6] may have an important bearing on the philosophy of essentiality of amino acids. He reported that young rats given a complete diet containing all the essential amino acids failed to grow if succinylsulfathiazole was added to the diet. Having taken into consideration the vitamins known to be synthesized by the bacteria in the intestine, the suggestion is made that a significant part of the nonessential amino acids is provided to the host organism by synthetic action of the intestinal bacteria; once these are rendered inactive by the sulfonamide drug, the real need of the host for preformed amino acids is disclosed. Although further work in this field is needed, it is already obvious that the concept of indispensability of any dietary constituent can be held only under well defined conditions. This view applies likewise in the field of therapeutics and so merits renewed attention in medicine.

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TERMINOLOGY OF CORONARY DISEASE

Master [1] believes that the adoption of the term "coronary failure" to designate acute coronary seizures would lead to ambiguity and confusion. He would retain both terms "coronary occlusion" and "coronary insufficiency," since each represents an entity more or less readily distinguishable by the mode of onset, the symptoms and the characteristic electrocardiographic alteration. Coronary artery occlusion means sudden, complete obstruction of a coronary artery characterized clinically by an attack of severe and prolonged substernal pain, shock, impairment of the first heart sound, gallop rhythm, occasionally a pericardial rub, a fall in blood pressure, fever, leukocytosis and a rapid sedimentation rate. Acute coronary insufficiency indicates necrosis or infarction of the myocardium without com-

1. Master, Arthur M.; Jaffe, Harry L.; Dack, Simon, and Grishman, Arthur: Coronary Occlusion, Coronary Insufficiency and Angina Pectoris: A Clinical and Postmortem Study, Am. Heart J. **27:** 803 (June) 1944.

plete closure of a coronary artery. Pain and necrosis or infarction of the myocardium may be produced by severe or prolonged diminution in the coronary flow in the absence of coronary occlusion.

The major difference between coronary occlusion and coronary insufficiency is in the mode of onset. Coronary occlusion begins independently of outside influences such as effort and excitement; actually it is most common during rest or sleep. Coronary insufficiency, on the contrary, is due to a sudden inadequacy of coronary blood flow produced by a number of factors, such as unusual effort, emotion, acute hemorrhage, shock, tachycardia, heart failure and surgical operations. If either increased cardiac work or diminished coronary blood flow develops in the presence of coronary artery disease, the myocardium may become ischemic; if the precipitating factor persists, necrosis of the heart muscle may ensue. Unlike coronary occlusion, pain may be a minor symptom in coronary insufficiency and sometimes is obscured entirely by the condition causing the ischemia, for example, shock or surgical operation. The electrocardiogram is considered characteristic of acute coronary occlusion when elevation of the RS-T segment and a deep Q wave are present in one or more leads, with progressive change from RS-T elevation to T wave inversion in serial records. In acute coronary insufficiency the typical electrocardiographic changes consist of RS-T depression and T wave inversion in two or more leads. RS-T elevation and deep Q waves are absent. Unlike that in coronary occlusion, the electrocardiogram returns to its original configuration in several days or weeks.

The concepts that have been described were evaluated in a clinical, electrocardiographic and postmortem study of 100 consecutive cases in which the diagnosis of coronary occlusion had been contemplated. In 49 cases the electrocardiographic pattern was considered characteristic of coronary occlusion, and the latter was found post mortem in 47 of these. In addition, the electrocardiogram clearly indicated whether the infarction was anterior or posterior. Not every attack of coronary occlusion results in typical electrocardiographic alteration; this is true chiefly in multiple fatal attacks. When the electrocardiogram presents RS-T elevation and Q waves, the diagnosis of coronary occlusion is practically certain. Progressive RS-T depression or T wave inversion were present in 5 cases, and the necropsy revealed in all 5 cases coronary sclerosis without occlusion. Thus the authors were apparently able to differentiate coronary occlusion from coronary insufficiency in 95 per cent of their cases on clinical and electrocardiographic data.

Masters and his collaborators feel that the term "angina pectoris" should be retained because of its classic clinical picture. The syndrome is represented by the typical substernal pain and its radiation, its relation to effort, excitement, cold and eating and its relief by rest and glyceryl trinitrate. The term connotes one type of coronary insufficiency. It differs from the more severe forms of coronary insufficiency in that anatomic alterations do not occur in the cardiac muscle; the attack of pain is usually of short duration, shock is absent, the heart sounds and blood pressure are not significantly altered, and pericardial rub and heart failure do not appear. Fever, leukocytosis and an increase in the sedimentation rate are absent. Immediately after the attack the patient returns to his previous condition, that is, he may feel entirely well. The electrocardiogram is usually normal, but the changes characteristic of coronary insufficiency may appear transiently during the attack.

Current Comment

QUINACRINE (ATABRINE) IS SATISFACTORY IN MALARIA CONTROL

An official report from the Board for the Coordination of Malarial Studies on the use of atabrine in the prevention and treatment of malaria appears on page 977. It answers the questions which have been in the minds of many physicians relative to the comparative advantages and disadvantages of quinine, totaquine and quinacrine (atabrine). The postwar world, with the knowledge now available about this drug and on methods of malaria prevention, should be able to eliminate malaria from every civilized nation. That would be, indeed, a blessing derived from the most destructive and costly war the world has ever known.

EFFECTS OF VARIATIONS IN INTRACRANIAL PRESSURE

Experiments on variations in intracranial pressure reported by Kahn [1] were begun with the intention of studying the effect of experimentally produced cerebral edema on consciousness in the dog. Distilled water was perfused into the anatomic central end of the common carotid artery, and observations were made as to whether or not this would render the animals comatose. Records with the kymograph were taken simultaneously of the respiration, the general carotid blood pressure, the cerebrospinal fluid pressure in the cisterna magna and the pressure in the brain tissue. The assumption that the pressure in the lateral ventricles was being accurately recorded by measurement of the cisternal pressure was later demonstrated to be fallacious, so that the intraventricular pressure was simultaneously recorded thereafter with a mercury manometer. Kahn's studies indicate that the respiratory and circulatory embarrassment associated with high levels of intraventricular and intracerebral pressure may be relieved by ventricular drainage, which lowers both the intra-

1. Kahn, Alfred J.: Effects of Variations in Intracranial Pressure, Arch. Neurol. & Psychiat. **51**: 508 (June) 1944.

ventricular and the intracerebral pressure. In experiments on otherwise normal animals in which the intraventricular pressure was abruptly raised to levels between 60 and 10 mm. of mercury below the diastolic blood pressure, accompanied by measures designed to keep the cisternal pressure low, the respiration became directly affected; it became depressed and inhibited more quickly in general at the higher pressures than at the lower pressures employed. The ill effects of increased intraventricular pressure (with low cisternal pressure) appeared to be due to the herniation of the medulla into the foramen magnum. This herniation was observed in dogs as a result of elevation of the intraventricular pressure while the cisterna magna was opened to the exterior. Ventricular drainage, together with artificial respiration and administration of isotonic solution of three chlorides infused into the central end of the common carotid artery, was efficacious in restoring respiration and increasing the blood pressure after severe medullary trauma in the water perfusion experiments in dogs. The fact that the experimentally produced state of high intraventricular and low cisternal pressure gives rise to dire respiratory and circulatory effects, which disappear when the disparity between the two pressures is reduced, appears to be clinically significant. Serious danger is involved in lumbar puncture when the possibility of a block between the ventricular reservoir and the subdural fluid spaces exists. Kahn believes that use of lumbar puncture as a means of relief of intracranial tension is contraindicated because of this danger when there is internal hydrocephalus subsequent to severe cranial trauma. Ventricular drainage is indicated and should be done as quickly as possible because of the damage to the medullary centers by prolonged tension.

INFLUENCE OF TEMPERATURE CHANGE ON ANGINA PECTORIS

Patients with angina pectoris commonly experience an increased frequency of attacks during cold weather. Now this response has been used as an aid in diagnosis and also for investigation of certain aspects of the disease. Patients were placed in a cold room, thereby precipitating an attack. In a recent investigation by Freedberg and his colleagues [1] 22 patients with angina pectoris due to coronary arteriosclerosis were studied. Local application of ice to the hand during exercise reduces the exercise tolerance of patients with angina pectoris and results in the precipitation of pain even when the patient is in a warm room. This observation parallels the experience of many patients with angina pectoris who, although warmly clothed and with only the face exposed, nevertheless have more attacks of pain in winter than in summer. The effect of local application of cold was extremely rapid; it could be demonstrated in ten seconds, reached a maximum in thirty to forty seconds after application and could not be prevented by obliteration of the venous return from the area to which the cold was applied. The prior application of heat or the administration of nitroglycerin nullified this effect, however. The concept that coronary artery vasomotor changes, probably reflex in origin, exert a contributory influence in the precipitation of attacks of angina pectoris and that heat acts as a coronary vasodilator and cold as a vasoconstrictor or to prevent vasodilatation is supported by these results. The prophylactic use of heat enables many patients with angina pectoris to perform considerably more work in a cold atmosphere and suggests that the local application of heat may be of value in the prevention of attacks in daily life under certain circumstances. The local application of ice was reported to be a valuable clinical substitute for a cold room in precipitating attacks of angina pectoris for diagnostic or other investigative purposes.

1. Freedberg, A. Stone; Spiegl, Erwin D., and Riseman, Joseph E. F.: Effect of External Heat and Cold on Patients with Angina Pectoris: Evidence for the Existence of a Reflex Factor, Am. Heart J. **27**: 611 (May) 1944.

ASCORBIC ACID LOSS IN MINCED SALADS

Recent studies [1] have shown that mincing speeds the rate of disappearance of ascorbic acid from fresh fruits and vegetables; enzymes, metallic catalysts and fine division apparently favor oxidation. In military service minced salads are often prepared several hours before serving, so that methods of preventing rapid loss of this essential vitamin are of strategic importance. McCay and his associates [2] of the National Naval Medical Center, Bethesda, Md., therefore undertook a study of the effects of variations in routinely used technics for mincing. Cabbage, cucumbers, tomatoes, lettuce and other salad vegetables were sliced or minced by three different technics. The first samples were thinly sliced with a plastic knife. Duplicate samples were similarly prepared with a steel knife. A third group of samples was put through the standard metallic "Buffalo chopper." Each sample of minced green peppers, for example, had an initial vitamin C content of 130 mg. per hundred grams. In the plastic sliced samples this fell to 87 mg. per hundred grams by the end of two hours, a 33 per cent loss in vitamin C. The rate of loss was twice as fast in control samples sliced with a steel knife, the ascorbic acid content falling to 53 mg. per hundred grams. The loss was even more rapid in samples minced in the metallic chopper, the two hour assay being only 31 mg. per hundred grams, a 75 per cent loss. Similar differences in the rate of disappearance of vitamin C were noted with all other vegetables. With radishes, for example, the two hour loss was 90 per cent of the initial ascorbic acid content when this vegetable was minced in the metallic chopper. The loss was but 30 per cent if it was sliced with the plastic knife. To minimize vitamin loss in military service, McCay believes that some form of plastic chopper should be devised and substituted for the present metallic grinder, and that wherever possible sliced or minced salads should not be prepared until just before serving.

1. King, C. G.: The Physiology of Vitamin C, J. A. M. A. **111**: 1098 (Sept. 17) 1938.
2. McCay, C. M.; Pijoan, Michel, and Taubken, H. R.: Science **99**: 454 (June 2) 1944.

MEDICINE AND THE WAR

QUINACRINE HYDROCHLORIDE (ATABRINE) FOR MALARIA

On May 31, 1944 the Board for the Coordination of Malarial Studies adopted the following resolution concerning the relative value to the armed forces of quinacrine hydrochloride, U. S. P. (atabrine), quinine and totaquine, U. S. P.

On the basis of controlled quantitative studies in civilian, Army and Navy establishments, the evidence at hand justifies the following statement:

1. *In the Suppressive Therapy.*—Quinacrine (atabrine) has proved to have all the antimalarial properties ascribed to quinine in the suppression of malaria during and subsequent to exposure to infected mosquitoes. Effective suppression can be accomplished over long periods of time by proper use of quinacrine. Available evidence indicates that this end may be achieved without danger to the individual.

Earlier reports indicated a significant incidence of gastrointestinal disturbances in certain groups of men receiving suppressive quinacrine therapy. For practical purposes these adverse reactions can be avoided by proper administration of the drug. Quinine, in doses adequate to assure suppression of malaria equivalent to that produced by quinacrine in the dosage currently used by the armed forces, is frequently attended by symptoms of cinchonism.

Quinacrine has been demonstrated to prevent consistently the development of falciparum malaria when the drug is administered in proper dosage before, during and after exposure.

2. *In the Therapy of the Acute Attack.*—Experience in the past two years has demonstrated conclusively that quinacrine (atabrine) when properly administered is fully as effective as quinine in the termination of the acute attack and is safer than quinine. The intramuscular injection of quinacrine is highly effective in securing a rapid therapeutic response. Evidence is not at hand to decide on the relative merits of quinacrine administered intramuscularly as compared with quinine administered intravenously in patients with fulminating cerebral malaria.

3. *In the Therapy of Vivax Malaria.*—Neither quinacrine nor quinine can be relied on to prevent relapses in vivax malaria following the discontinuation of therapy, although the interval between attacks is significantly longer following quinacrine than following quinine in the dosage schedules currently used by the armed forces.

4. *In the Therapy of Falciparum Malaria.*—There is convincing evidence that quinacrine not only suppresses the clinical symptoms of falciparum malaria but also cures this malignant form. The evidence of a similar curative effect of quinine is not conclusive.

5. *Totaquine (U. S. P.).*—Because of its content of crystallizable cinchona alkaloids, totaquine (U. S. P.) has activity which approximates that of quinine and therefore can be used as a substitute for quinine when given orally. The antimalarial activity of totaquine (U. S. P.) is dependent on the amount of crystallizable alkaloids in the preparation rather than on the specific amount of each individual alkaloid. Gastrointestinal disturbances occur more frequently following the use of the present totaquine (U. S. P.) than they do following the use of quinine or quinacrine.

On the basis of the foregoing statement, it is resolved:

1. That no advantage, and possible disadvantage, would accrue to the armed forces were quinine or totaquine to replace quinacrine for the routine suppression and treatment of malaria.

2. That the large scale production of quinine or totaquine is not now considered a matter of importance for the management of malaria among Army and Navy personnel. It is possible that a supply of totaquine in excess of the present stockpiles may be required for therapy in civilian populations temporarily under the jurisdiction of the armed forces in occupied territory where immediate dissemination of information concerning the use of quinacrine (atabrine) is not practicable. In this connection it should be kept in mind that after the war the overall need for all established antimalarial drugs will continue to be great.

BOARD FOR THE COORDINATION OF MALARIAL STUDIES, NATIONAL RESEARCH COUNCIL: R. F. Loeb, Chairman; W. M. Clark; R. G. Coatney, U. S. P. H. S.; L. T. Coggeshall, Comdr. (MC), U.S.N.R.; F. R. Dieuaide, Lieut. Col., M. C., A. U. S.; A. R. Dochez, O. S R. D.; E. G. Hakansson, Capt. (MC), U.S.N.; E. K. Marshall Jr.; O. R. McCoy, Major M. C., A. U. S.; F. T. Norris, Lieut. Comdr. (MC), U.S.N.; W. H. Sebrell, U. S. P. H. S.; J. A. Shannon, and G. A. Carden Jr., Secretary.

PROCUREMENT AND ASSIGNMENT SERVICE FOR PHYSICIANS, DENTISTS AND VETERINARIANS

UNITED STATES PUBLIC HEALTH SERVICE NEEDS PHYSICIANS

The U. S. Public Health Service needs 322 physicians immediately. About 170 of these are needed for assignment to duty in the War Shipping Administration, for foreign shore duty with the UNRRA and for sea duty and foreign shore duty in the U. S. Coast Guard. One hundred and fifty-two physicians are needed for duties in Hospital Division, Foreign Quarantine, Tuberculosis Control, Venereal Disease Control and other states relations work. The U. S. Public Health Service has asked that state chairmen be informed of these needs in order that available physicians may apply for reserve commissions.

INCREASE IN AREAS IN NEED OF PHYSICIANS

The first three months of 1944 show an increasing number of areas in need of physicians reported by state chairmen to the central office of the Procurement and Assignment Service. The rise in areas reported may reflect an increase in medical care needs or may be the result of improvement in reporting by state chairmen. Shortage reports are now being submitted more regularly than in the past. It will not be possible to make comparisons and draw definite conclusions until complete returns are received each month from each state.

The record of medical care need for January is based on 41 current reports, on 47 for February and on 53 for March. The number of communities in need of physicians rose from 170 in January to 185 in February and to 199 in March. The number of physicians needed throughout the nation according to state chairmen was 225 in January and 232 in February and in March. Consistently the need has been for general practitioners, only 11 per cent of each month's total need being for specialists.

SANITARY CORPS OFFICERS NEEDED

A recent announcement by the Surgeon General of the Army indicates that there is need for a limited number of sanitary engineers, bacteriologists, biochemists and entomologists as commissioned officers. Eligible sanitary engineers will be cleared through the Procurement and Assignment Service with procedures similar to those in effect for the processing of physicians. Qualified specialists in these fields will receive ranks commensurate with their experience and ability.

ARMY

MALARIA IN THE ARMY

In the present war casualties from malaria have been an important factor influencing military operations in certain theaters of action. In overseas areas the total number of deaths directly attributable to malaria in 1943 was under 100. Patients who died usually had fever for only two or three days. The rates of the disease in highly malarious theaters are now but one fourth to one third of that which existed early in the war. Quinacrine has proved equal and in some ways superior to quinine for suppressing symptoms among troops operating under conditions where complete protection from malaria carrying mosquitoes is not possible. Individual preventive measures have been improved by the development of highly effective mosquito repellents and aerosol sprays. In this country as part of the army program an enormous mosquito control campaign was organized and carried out in 1941 at a cost of almost $2,000,000. The malaria rate during that year not only failed to rise in the face of enormous increments to the military establishments but actually dropped to the low figure of 1.7 per thousand. In 1942, after the campaign had been intensified, the malaria rate for troops in this country decreased to 0.6 per thousand and in 1943 dropped still lower to 0.2 per thousand. The mosquito control program has effectively prevented malaria from becoming a problem among troops stationed in the United States.

AUSTRALIAN FLAG GIVEN AMERICAN ARMY NURSES

An Australian flag has been donated to the Army Nurse Corps by a nurses' welfare association in Tasmania in appreciation of the work of American nurses in Australia. The flag was presented as a "link of friendship" by the Armed Services Nurses Welfare Association of Tasmania. The association requested that the flag be presented by the Australian delegate to the International Labor Conference in Philadelphia, and Col. Florence A. Blanchfield, superintendent of the Army Nurse Corps, designated Major Edna D. Umbach, principal chief nurse of the Valley Forge General Hospital, Phoenixville, Pa., to receive it. In a letter explaining the purpose of the gift, Miss Edith Ransom, state president of the Tasmanian nurse group, said its members wished to show "their appreciation of the work of the American nursing services in Australia."

BRONX AREA STATION HOSPITAL

The Bronx Area Station Hospital, New York, formerly the Lebanon Hospital, was formally dedicated on June 7. The hospital was taken over by the Army about a year ago and was originally intended for the use of women in the military services. The hospital's purpose has now been altered to care for transient army personnel within the area including upper Manhattan, the Bronx and Putnam and Westchester counties, west of the Bronx River and Taconic State Parkway. The hospital is an eleven story structure with a capacity of 200 beds. The staff includes eleven medical officers, six dental officers, three medical administrative officers, sixteen nurses, fifteen nurse's aides and a Red Cross staff of eighteen as well as Medical Department enlisted men and civilian employees.

ARMY MEDICAL LIBRARY STAFF CHANGE

A recent army regulation announced that the Army Medical Library, often referred to as the Surgeon General's Library, shall be administered by an officer of the Medical Corps with the title of Director. The Director is charged with the general administration, with upholding policies laid down by the Surgeon General, and representing the library before the public. A principal assistant to the Director with the title of Librarian may be either a commissioned officer or a civilian. "The Librarian shall possess a wide knowledge of and experience in library methods. Under the Director, he is charged with the coordination and technical operation of all elements of the Library."

ARMY AWARDS AND COMMENDATIONS

Captain Martin M. May

The Soldier's Medal was recently awarded to Capt. Martin M. May, formerly of Marion, Ill., who is now serving in the Army Medical Corps in Italy. The citation accompanying the award read "for heroism not involved in conflict with the enemy. On 7 June 1944 a fire of unknown origin started in the engineer combat battalion supply dump. The fire spread quickly through the inflammable materials in storage. Most of the men were trying to extinguish the conflagration when a tremendous explosion threw them to the ground, sending sheets of flame and smoke and bits of torn metal throughout the area. Twenty-four men and three officers were killed by the blast. As the smoke cleared away, Captain May saw Technician Fourth Grade Weibrich, severely burned, internally injured and suffering from shock, attempting to crawl out of the flaming area. With complete disregard for his own life Captain May left his place of safety and with the help of an enlisted man ran into the flaming inferno and carried Weibrich out. Although there were still small explosions, and knowing that the fire might engulf the wounded man, Captain May courageously and heroically risked his own life in the face of known danger to rescue Technician Weibrich. Captain May then proceeded to organize his medical aid men and some volunteers to treat the casualties. He personally administered morphine and blood plasma to the most severely wounded. Unquestionably Captain May's prompt calculated actions saved the sight and the lives of several of the men. His heroic conduct is a credit to himself and to the Medical Corps." Dr. May graduated from St. Louis University School of Medicine in 1938 and entered the service Oct. 7, 1942.

Major Horace B. Dozier

Major Horace B. Dozier was presented with the Legion of Merit Award recently for exceptionally meritorious service in the North African Campaign. The citation read "For exceptionally meritorious conduct in the performance of outstanding services as hospitalization and evacuation officer from 21 March 1943 to 21 July 1943. During this period the base section supported the operation of the American forces in the Tunisian campaign. During the final phases of this campaign Major Dozier actively participated in the forward area by coordinating and supervising the evacuation of battle casualties. He assisted in the preparation and execution of the entire hospitalization and evacuation program. This program was so efficiently planned and executed that the evacuation of patients was effected with an absolute minimum of delay, even during the final phases when movements of large units were made with great rapidity, evacuation lines were long and communication facilities almost nonexistent. The efficient and capable manner in which Dozier carried on his duties played a great part in the excellent medical care which was provided for battle casualties." Dr. Dozier graduated from Tulane University of Louisiana School of Medicine, New Orleans, in 1939 and entered the service June 29, 1941.

Colonel Edward J. Kendricks

The Legion of Merit was awarded by the War Department to Col. Edward J. Kendricks, a regular army officer since Oct. 1, 1930, "for exceptionally meritorious conduct in the performance of outstanding service from September 1942 to October 1943." Dr. Kendricks graduated from Northwestern University Medical School, Chicago, in 1922.

Captain Seymour L. Osher

Capt. Seymour L. Osher, formerly of Maywood, Ill., was recently awarded the Bronze Star for heroic action in Italy. The award was for remaining at his post and performing surgery despite the fall of flak throughout the hospital. Dr. Osher graduated from the University of Illinois College of Medicine, Chicago, in 1940 and entered the service Feb. 20, 1942.

ORGANIZATION SECTION

WASHINGTON LETTER

(From a Special Correspondent)

July 31, 1944.

Another Aspect of Medical Manpower Shortage

Another aspect of the nation's critical shortage of medical manpower is underscored in figures presented to a new national venereal disease committee appointed recently by Paul V. McNutt, Federal Security Administrator, to "plan new programs in the fight against venereal diseases and their spread." Although progress has been made in controlling incidence of venereal diseases in the Army and Navy "to the lowest point in history," there has been a slight current increase, from which the following factors were elicited: (1) increased reporting of infections with the advent of penicillin and the shorter period required for treatment, (2) shortage of trained venereal disease men in this country after the departure of more trained men for overseas duty and (3) the possibility of laxity induced by over-reliance on new methods of treatment.

Col. Thomas H. Sternberg, representing the Army, informed the committee of an upward trend in army venereal disease rates in continental United States to 30 per thousand as compared with the average rate of 26 per thousand over the past year. Comdr. W. H. Schwartz said that the navy rate for continental Europe showed a slight increase in the same period. Despite these trends, both the Army and the Navy reported substantial decreases in days lost because of venereal disease, attributed to the use of penicillin, reducing the time required for treatment.

The new committee is composed of fifteen, including representatives of private organizations, the Army and Navy, the Public Health Service and the Social Protection Division of the Federal Security Agency. The committee will seek greater community and national cooperation in venereal disease control with a view to maintaining gains made into the demobilization period.

The committee hopes to augment for the postwar period these cooperative efforts. It has been established that no man will return to civilian life from the armed forces with a venereal infection that has not been cured or rendered noninfectious. It is believed that the coming period is a strategic time to eradicate the venereal scourge, but there is danger of a psychologic letdown.

Members of the National Venereal Disease Committee are the Rt. Rev. Harold J. Carroll, assistant general secretary, National Catholic Welfare Conference; Dr. Belmont Farley, National Education Association, 1201 16th Street N.W., Washington, D. C.; Dr. T. K. Lawless, dermatologist and consultant, Providence Hospital, Chicago; Mrs. Mabel K. Staupers, executive secretary, National Association of Colored Graduate Nurses, 1790 Broadway, New York; John A. Sengstacks, president, Negro Publishers' Association, managing editor, Chicago *Defender*, Chicago; Bishop R. R. Wright Jr., executive director, Fraternal Council of Negro Churches, Wilberforce, Ohio; Dr. Mordecai Johnson, president, Howard University, Washington, D. C.; Dr. Heller, assistant surgeon, Division of Venereal Diseases, U. S. Public Health Service, Bethesda, Md.; Dr. William F. Snow, American Social Hygiene Association, New York; Dr. Alphonse M. Schwitalla S. J., St. Louis University School of Medicine; Colonel Sternberg, U. S. Army; Commander Schwartz, U. S. Navy; Felix J. Underwood, Mississippi State Board of Health, Jackson, Miss.; Ralph McGill, editor, Atlanta *Constitution*, Atlanta, Ga.; Watson B. Miller, assistant administrator, FSA; Rev. Roswell Barnes, associate general secretary, Federal Council of the Churches of Christ in America, New York; Mark A. McCloskey, director, Office of Community War Services and Eliot Ness, director, Social Protection Division, CWS.

Egyptian Minister of Health Touring the United States

Since the Allied victory at El Alemein signalized a victorious trend in the war, Egypt has been able to give some thought to postwar problems. So declares His Excellency, Dr. W. A. W. Wakil, Egyptian minister of health, recently a delegate at the monetary conference, who after a brilliant social reception in the capital has been touring the United States in connection with his own comprehensive health program for his country. Scientifically modern in his views, Dr. Wakil has mapped out a progressive program for Egypt, whose health problem, largely centered in the villages of rural areas, offers some interesting comparisons with this country. His trip here is nonpolitical and of a purely scientific and medical nature, and he is studying health, sanitation and hygiene methods, especially in our rural areas where the climatic conditions are nearest those in Egypt. Indicative of his outlook is his warning, well publicized in the daily press, that air traffic has increased the spread of communicable diseases. He advocates an international health conference to be held within two or three months to set up prevention measures to combat transport of diseased persons, bacteria and insects by airplane. As an illustration, he says the Gambia mosquito was brought to Egypt for the first time via plane and cases of malaria have resulted. In this connection Dr. Wakil proposes to study quarantine methods in the aviation center at Miami.

Basic factor in the overall health problem in Egypt, he says, is an exceptionally high birth rate. The rapid growth of population, unaccompanied by a parallel increase of national resources, is affecting public health through increased poverty, more overcrowding and more nuisances both in villages and in the poorer quarters of cities. The majority of Egyptians are employed in agriculture, with only some 700,000 persons, about 4 per cent of the population, employed in medium and large factories.

Dr. Wakil lists, as the principal health problems of Egypt, defective rural sanitation and welfare, paucity of pure water supplies in villages and high incidence of Bilharzia and Ancylostoma, high child mortality, incomplete campaigns against tuberculosis, venereal disease and leprosy, deficient hospitalization of the sick and defective urban sanitation. To meet them he advocates a five or ten year plan. He offers the following postwar health projects to deal with these problems:

1. Rural health reform: A. Generalization of pure water supplies. B. Generalization of rural health centers (for every 15,000). C. Eradication of Bilharzia and Ancylostoma. D. Village reconstruction by (*a*) radical methods, e. g. (1) construction of new villages, or (2) gradual village planning and sanitation. E. Abolition of remaining ponds and marshes.

2. Urban health reform: A. Generalization of drainage schemes. B. Generalization of urban health centers (for every 30,000).

3. Miscellaneous: A. Provision of more facilities for general and special hospitalization and treatment of the sick. B. Completion of the antituberculosis scheme. C. Completion of the antileprosy scheme. D. Introduction of more decentralization in the health administration. E. Provision of more medical and auxiliary staff.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ARKANSAS

Norman Baker Released from Prison.—Norman Baker, former operator of alleged "cancer cure" hospitals at Muscatine, Iowa, and Eureka Springs, Ark., was to be released from the Leavenworth Federal Penitentiary July 19, newspapers reported. Baker was convicted at Little Rock in January 1940 on a charge of using the mails to defraud in the advertisement of a cancer treatment and was sentenced to four years in prison and fined $4,000. He began serving the sentence in March 1941.

COLORADO

Personal.—Dr. Guy E. Calonge has been named a member of the La Junta School Board.——Dr. and Mrs. Thomas J. Jones, Hooper, observed their fiftieth wedding anniversary, June 6.

Rheumatic Fever Control Program.—The public policy committee of the Colorado State Medical Society recently rejected a proposed plan for rheumatic fever control in metropolitan Denver submitted by the state board of health and offered, instead, an alternate plan. Under the state board's plan the source of funds to finance the project would be an allotment of $20,000 by the U. S. Children's Bureau, a grant of $10,000 from the Denver War Chest for a diagnostic clinic, and available resources of existing hospitals wishing to participate. Administration would be by the state board and the participating hospital, the diagnostic clinic to be established at hospitals approved by the Medical Society of the City and County of Denver. Certain regulations were stipulated for basic professional services, plans for providing care, transportation facilities, education and mental hygiene, the last to be covered by the Child Guidance Clinic of the Colorado Psychopathic Hospital. The public policy committee of the state medical society submitted the following recommendations as signposts of policy for setting up the program, believing they will assist in avoiding the dangers of "bureaucratic sovietized medicine" and lead to a "noncompulsive, democratic program of sane public health":

1. The development of a statewide, rather than a local, cooperative rheumatic fever control program to be financed by such federal funds as are now available from the United States Children's Bureau and by any other funds available through appropriations from the Colorado state legislature or by Community Chest grants or private contributions.

2. The strict administration and supervision of this program by the Colorado State Board of Health.

3. The diagnostic and treatment aspects of the program to be carried out entirely and exclusively in private hospitals accredited by the American College of Surgeons and in convalescent homes approved by the Colorado State Board of Health.

4. The actual clinical work of the program, in both its diagnostic and its therapeutic aspects, to be performed entirely by physicians in private practice working on a part time basis and at a rate of compensation comparable to that prevailing in their various specialties in their particular communities.

5. The physicians employed to carry out the clinical part of the program to be certified specialists in their various fields of medical practice (pediatrics, cardiology, orthopedic surgery, psychiatry, neurology, etc.) by their respective national specialty boards. However, in those rural districts where specialists are not readily available it is recommended that the state board of health be permitted to waive specialty requirements.

6. The nursing care to be provided by the nursing staffs of the participating hospitals—by school nurses—by nurses from accredited visiting nurses' associations and by the division of public health nursing of the Colorado State Board of Health.

7. The social work of the program to be provided by the social service staffs of those participating hospitals equipped with social service departments and by the Colorado State Board of Health.

8. The educational needs of the children treated under this program to be provided by existing private and public school teaching, vocational training and recreational facilities.

9. The follow-up care of the children treated to be under the joint supervision of the participating hospitals and the Colorado State Board of Health.

10. The mental hygiene aspects of the program to be directed by psychiatrists and neuropsychiatrists in private practice working on a part time basis in and through the various participating private hospitals or in their own private offices.

11. The program to be strictly limited to the diagnosis and treatment of acutely ill, financially eligible children properly referred to the Colorado State Board of Health by private physicians or accredited hospitals and health agencies.

12. Financial eligibility for free care under this program to be determined, in each case, by the Colorado State Board of Health in accordance with established standards for free medical care in Colorado.

ILLINOIS

New Chairman of Public Health Committee.—Benjamin Wham, Winnetka, has been appointed chairman of the Illinois Statewide Public Health Committee to succeed Frederic C. Woodward, LL.D., Chicago, resigned.

Physicians Honored.—The Saline County Medical Society held a dinner June 23 in Eldorado in honor of Drs. William T. Johnson, Eldorado; Joseph V. Capel, Harrisburg, and William D. Harrell, Norris City, who have completed fifty years in the practice of medicine and who have been awarded membership in the "fifty year club" of the state medical society.

Chicago

Personal.—Dr. Benjamin J. Feinstein was to retire July 31 as a police surgeon, after holding the position for twenty-seven years.

Psychiatric Clinic for Discharged Service Men.—The Illinois Society for Mental Hygiene announces the establishment of a psychiatric clinic in Chicago for service men discharged for psychiatric disorders. The clinic, which began July 18, will be open one evening a week in the former Washington Boulevard Hospital at 2449 West Washington Street. In the fall the services will be increased. The staff will include psychiatrists, psychologists and psychiatric social workers. It is hoped that similar clinics may be created throughout the state.

INDIANA

Activities at Indiana University.—In a recent statement to the board of trustees of the university, Dr. Willis D. Gatch, dean of the Indiana University School of Medicine, Indianapolis, stated that his division "has thrived on adversity," now having enrolled 313 medical students, 300 nurses, 14 laboratory technicians and 21 dietitians. Dr. Gatch stated that military discipline had been good for the students, having taught them to respect authority, to be punctual and to work. Students who fail at the end of the semester are not allowed to repeat the work and must leave school at once. Dr. Gatch stated that few failures had occurred except in the freshman year. In carrying out the program of the school, Dr. Gatch stated that one change affecting the curriculum was "the cutting away of obsolete and worthless material" and the reduction of the amount of work given in the specialties to that which a general practitioner needs to know. The students have been brought as much as possible into direct contact with the patients and have been made responsible for their own education. A resident clerkship procedure, inaugurated last year for an experimental period, was made effective in May of this year. This program includes an arrangement whereby each senior spends one semester as a resident clerk in the university hospitals or at Indianapolis City Hospital. Tentative postwar plans include the establishment in association with the Indiana State Board of Health of a school of public health, creation of extension courses of graduate medical instruction for hospital staffs and continuation of research activities.

KENTUCKY

Personal.—Dr. Milton Lopez Henriques, director of local health services for the Ministry of Health of Venezuela, is spending two months with the state health department in Kentucky under the auspices of the Rockefeller Foundation, according to the *Kentucky Medical Journal*.

Changes in Health Officers.—Dr. Jacob Leland Tanner has resigned as health officer of Mercer County, effective July 1, to reenter the private practice of medicine in Henderson.——Dr. Donald B. Thurber has resigned as director of the tricounty health department, Carrollton. Dr. Thurber, who will go to Paris to hold a similar position in Bourbon and Scott counties, will be succeeded by Dr. Mildred E. Burton, Gabbard, who is being transferred from the Owsley County Department of Health, Booneville. Dr. Thurber will succeed P. A. Surg. George M. Jewell, U. S. Public Health Service Reserve, at the Paris unit.

Dr. Howard Honored for Legislative Work.—Dr. Carl C. Howard, Glasgow, was honored at a public celebration at the Glasgow Country Club, July 13, for his efforts as chairman of the planning committee of the Kentucky State Medical Association in urging the passage of legislation creating six districts for tuberculosis hospitals in the state. The bill, appropriating funds for construction of the hospitals, passed

both houses of the general assembly unanimously and Dr. Howard is credited with having worked untiringly in bringing this about. Included among those at the celebration were the officers of the state medical association and the Barren County Medical Society, the state health commissioner, the lieutenant governor, a state senator and three members of the house of representatives.

MARYLAND

Occupational Disease Amendment.—The Maryland State Department of Health and the Baltimore City Health Department recently amended its occupational disease regulation governing limits for toxic materials. The change provides that exposures to dusts, fumes, mists, vapors, gases or any materials that may affect health shall be kept below certain stipulated limits.

MASSACHUSETTS

Personal.—Dr. Claire W. Twinam, formerly acting medical superintendent of the Lakeville State Sanatorium, Middleboro, has been appointed to succeed Dr. Carl C. MacCorison as medical superintendent of the North Reading State Sanatorium, North Wilmington.——Dr. Emma M. Varnerin, formerly connected with the Boston Red Cross Blood Donor Center, is now assistant district health officer in Boston for the state department of public health.

Commitment to Penal or Mental Institutions Figure in Licensure.—At a meeting of the Massachusetts Board of Registration in Medicine May 17 it was voted unanimously that it shall be the policy of the board, following a hearing, to revoke or suspend as the case may be the registration of any physician who has been sentenced to a penal institution. The same action applies to the registration of any physician who has been committed to and not yet discharged from a mental hospital.

New Professorship of Nutrition at Tufts.—The selection of a professor of nutrition at Tufts College Medical School, Boston, is now being considered. Last year Tufts established a fund in the medical school to commemorate the seventieth birthday of Miss Frances Stern, chief of the food clinic of the Boston Dispensary, Boston (THE JOURNAL, July 31, 1943, p. 958). The fund was to be used by Miss Stern to extend the research and educational activities of the clinic. Recently the Frances Stern Committee on Nutrition was created, and one of its first actions was to approve the selection of a full professor of nutrition and to recommend a survey by members of the Tufts faculty who have included nutrition in their courses of the past practices and suggested future ones. The Charles Hood Dairy Foundation, a local group, has voted to contribute half the amount annually for three years that the nutrition committee believes would be needed to begin the project.

MINNESOTA

Kenny Technic Included in Continuation Course.—The University of Minnesota Center for Continuation Study Course sponsored a week's study in the management of infantile paralysis June 19-24, which was the first in a new series to include demonstrations of the Kenny technic and presentations on certain clinical and investigative aspects of the problem of poliomyelitis. A special faculty for the first course included Dr. Kenneth F. Maxcy, Johns Hopkins University School of Hygiene and Public Health, Baltimore; Dr. Joseph Moldaver, Neurological Institute, New York; Dr. Donald Y. Solandt, University of Toronto, Canada; Dr. Robert Ward, Yale University School of Medicine, New Haven; Dr. Arthur L. Watkins, Massachusetts General Hospital, Boston, and Dr. Abe B. Baker, Berry Campbell, Ph.D., Dr. Wallace H. Cole, Dr. Ernst Gellhorn, Dr. Miland E. Knapp, Dr. John F. M. Pohl, Dr. Lewis Sher, Dr. Harry G. Wood and Sister Elizabeth Kenny of the University of Minnesota. The investigative and Kenny training programs of the University of Minnesota are sponsored by the National Foundation for Infantile Paralysis. Additional information may be obtained about future courses from Dr. William A. O'Brien, University of Minnesota, Minneapolis 14.

MISSOURI

Personal.—Dr. Frank J. Tainter, St. Louis, will serve as college physician at Lindenwood College, St. Charles, for the remainder of the school term, taking the place of Dr. Eugene J. Canty, St. Charles, who is entering military service.

NEBRASKA

State Medical Election.—Dr. Charles McMartin, Omaha, was chosen president-elect of the Nebraska State Medical Association at its recent annual meeting; Dr. Floyd L. Rogers, Lincoln, is president. Drs. William J. Reeder, Cedar Rapids, and William J. Gentry, Gering, are vice presidents, Dr. Roy B. Adams, Lincoln, is secretary and Mr. M. C. Smith executive secretary. The next annual session will be held in Lincoln.

NEW HAMPSHIRE

Statewide Tuberculosis Register.—The *Bulletin* of the National Tuberculosis Association announced that New Hampshire has been chosen as the first state in which a statewide register is to be undertaken. New Hampshire was selected because of the state's small case load, limited area and unified control of tuberculosis activities. The bulletin states that if, after suitable trial, a statewide register proves to operate satisfactorily in New Hampshire, plans will be made to extend this type of register to larger states where the problem is much more complicated.

NEW JERSEY

Fifty Years of Medicine.—The Middlesex County Medical Society gave a dinner June 21 in honor of six physicians who had completed fifty or more years in the practice of medicine. Dr. Henry Haywood, New Brunswick, was toastmaster and the guests of honor were:

Dr. Grover T. Applegate, New Brunswick, sixty years in practice.
Dr. John L. Lund, Perth Amboy, fifty-two years in practice.
Dr. Charles B. Burnett, South River, fifty-one years in practice.
Dr. Ira T. Spencer, Woodbridge, fifty-one years in practice.
Dr. George W. Tyrrell, Perth Amboy, fifty-one years in practice.
Dr. Frank C. Henry Sr., Perth Amboy, fifty years in practice.

State Board Upheld on Granting of Licenses.—The practice of the New Jersey State Board of Medical Examiners in granting licenses only to graduates of medical schools accredited by the American Medical Association was upheld July 18 by the state supreme court, the New York *Times* reported. The court had been petitioned by Dr. Albert Seymour Rothseid, Lawrence, Mass., to compel the board to grant him a license to practice medicine and surgery in New Jersey. The board had denied Rothseid a license on the basis that the Middlesex University School of Medicine of Massachusetts, from which he was graduated in the winter of 1943, was not accredited by the American Medical Association and therefore was not on the approved list of the board. Rothseid's argument was said to be that the action of the board in accepting the grading of medical schools of the American Medical Association without using its own judgment or discretion constitutes an unlawful delegation of its duty and power. In rendering an opinion, Justice Newton H. Porter said, according to the *Times*, "We think not. It is entirely within its discretion, it appears to us, to adopt the standard and grading of an organization of which it has knowledge and confidence." Rothseid, son of Dr. Abraham Rothseid, Newark, has a license to practice medicine in Massachusetts and is a member of the staff of the Lawrence General Hospital, Lawrence, Mass.

Defense Council Functions as Disaster Unit.—The Newark Defense Council, originally set up as an air raid emergency council, now functions as a community disaster unit and is planned to work in close cooperation with the American Red Cross. In the event of a catastrophe there are three dispatching points in the city, the Emergency Medical Service Control Center, the Newark Beth Israel Hospital and the Columbus Hospital, from which emergency medical service units are dispatched. Each unit consists of nurses, a first aider, a nurses' aide, an attendant and a motor corps driver. The casualties are given first aid and if necessary are taken to the nearest hospital or casualty station. There are nine cooperating hospitals, five reserve hospitals and seven casualty stations which would be activated and manned in an emergency. During an emergency the hospitals report to the central control office, stating the number of beds and personnel available. Regular incident rehearsals are held each month. Medical observers witness each incident and report any faulty action. Dr. Joseph A. Clarken is director of the emergency medical service. Dr. Lester W. Eisenstodt is coordinator of hospitals. Other units function under specially appointed supervisors while the general personnel, who are fingerprinted and equipped with identification cards, armbands, gas masks and steel helmets, include 212 physicians classified under their specialties, 282 registered nurses, 530 student nurses, 66 practical nurses, 375 Red Cross nurses' aides, 59 first aiders, 13 Red Cross motor corps ambulance drivers, 12 hospital superintendents and 408 attendants.

NEW YORK

State Plans Free Plasma Distribution.—The state health department is working on a plan to develop a program to make whole blood, blood plasma and other derivatives available for civilians throughout the state, the New York *Times* reported July 14. Dr. John B. Alsever, U. S. Public Health Service, who is in charge of the Office of Civilian Defense plasma reserve program, has been lent to the health department to help it develop a distribution program. The plan recently inaugurated in Michigan is now being studied by the New York department (THE JOURNAL, April 1, p. 1000). The *Times* stated that about twenty hospitals in New York have been cooperating with the Office of Civilian Defense to meet emergency needs and that a number of other hospitals have maintained blood banks to handle possible disasters in larger centers. The value of this plan is too great to be limited and should be extended to other sections of the state, it was said.

New York City

Personal.—Dr. Jacob Sacks, formerly assistant professor of pharmacology, University of Michigan Medical School, Ann Arbor, has been appointed director of the pharmacologic laboratory of Endo Products, Inc., Richmond Hill.

Penicillin Free to Hospital Service Members.—Penicillin will hereafter be provided where necessary without charge to the hospitalized members of Associated Hospital Service using semiprivate and ward accommodations in 260 hospitals of the New York area. A special reserve fund is to be set up to reimburse hospitals for additional costs due to this and other unusual remedies required for the treatment of Associated Hospital Service members.

Noncommercial Drug Exhibit.—The New York Academy of Medicine has set up plans for a continuous noncommercial drug exhibit at its headquarters. The exhibit will be in charge of a physicians' committee on drug exhibits which will work with an advisory committee of drug manufacturers. Dr. Theodore G. Klumpp, president of Winthrop Chemical Company, Rensselaer, N. Y., is chairman of the advisory committee. A person will be in charge of the exhibit who will be able to answer questions and explain new drugs, and pamphlets and literature will be furnished, giving the research and clinical usage and describing the products.

Fluorine and Dental Caries.—The New York Institute of Clinical Oral Pathology will devote its first open meeting at the New York Academy of Medicine, October 30, to a symposium on fluorine and dental caries. Additional information may be obtained from Mr. G. Roistacher, executive secretary of the institute, 101 East 79th Street, New York. The institute was incorporated in New York on Dec. 20, 1932, organized for the study and advancement of oral pathology, particularly of the correlation of clinical findings, x-ray examination and histopathologic evidence. Dr. Raymond Gettinger, Brooklyn, is pathologist of the laboratory. Said to be the first of its kind, the institute's physical equipment began with the presentation by Dr. Theodor Blum of his medical laboratory with all specimens and apparatus.

OKLAHOMA

Physician Gives $100,000 to Orphan's Home.—Dr. and Mrs. Silas G. Hamm, Haskell, have given property and other considerations approximating $100,000 to the Tipton Orphan's Home of the Church of Christ. The gift will make possible the construction of three new buildings out of the six planned by the home.

Personal.—Dr. Elmer E. Goodrich, Crescent, has been named health officer of Chickasha and Grady County.——Dr. John F. Hackler, Oklahoma City, director, technical field unit, Oklahoma State Department of Public Health, has been appointed professor of hygiene and public health at the University of Oklahoma School of Medicine, Oklahoma City.

State Society Plans New Library.—The council of the Oklahoma State Medical Association recently approved the installation of a new council room and library in the office of the state association. The library will be set up with the idea of supplying complete information on the subject covered by membership committees.

The Dr. M. L. Perry Scholarship.—Dr. John C. Perry, Tulsa, has established an annual scholarship for premedical students at the University of Tulsa, to be known as the Dr. M. L. Perry Scholarship in honor of the late Dr. Marcus L. Perry, Tulsa, father of Dr. John C. Perry. Selection of the winner of the scholarship will be based on the contestant's past scholastic record, medical aptitude, character and financial need.

Plan for Health Education.—A program for health education will be launched in Oklahoma during the coming school year under the auspices of the state superintendent of public instruction, the state health commissioner and members of their respective staffs. As a preliminary step in the development of its program, workshops in health education were conducted in four centers from June 12 to June 23: Northeastern State College, Tahlequah, East Central State College, Ada.; Southwestern Institute of Technology at Weatherford and for Negroes at Langston University, Langston. The workshops were designed for superintendents, principals, teachers, directors of physical education, public health personnel, other professional personnel and lay persons in general who may be interested in promoting individual and community health. Special attention was given during these workshops to the formation of committees to outline a syllabus and other materials necessary to the success of the state plan for health education, which, it is hoped, will make for better relationships in health education between school and community.

VIRGINIA

Changes in the Staff at Medical College of Virginia.—Promotions on the staff of the Medical College of Virginia, Richmond, effective July 1, include the following:

Sumter S. Arnim, D.D.S., to associate professor of operative dentistry and pathology.

John C. Forbes, Ph.D., to research professor of biochemistry.

Dr. Emmett T. Gatewood to clinical professor of otology, laryngology and rhinology.

Dr. John S. Howe to professor of pathology.

Karl L. Kaufman, Ph.D., to associate professor of pharmacognosy.

Dr. Emanuel U. Wallerstein to professor of clinical otology, laryngology and rhinology.

Personal.—Dr. Walter L. Barnes, Petersburg, has been appointed coroner to succeed Dr. Elisha L. McGill, who resigned after holding the position since 1919.——Dr. Carl W. White has been appointed medical superintendent of the Lynchburg State Colony, Colony, succeeding Dr. George B. Arnold resigned.——Dr. William E. Brown, for twenty-three years medical director and superintendent of the Blue Ridge Sanatorium, Charlottesville, has resigned because of ill health. He has been succeeded by Dr. Frank B. Stafford, assistant superintendent since 1920.——Nelson Podolnick, assistant surgeon, U. S. Public Health Service Reserve, has been appointed health director for the health departments of Fairfax, Prince William and Stafford counties.

WASHINGTON

Advisory Committee Named for State Department of Health.—The board of trustees of the state medical association has approved the appointment of an advisory committee to the state department of health to be composed of the chairman of the following committees: industrial hygiene, maternal and child welfare, neoplastic, public health and sanitation, public laws, public relations, social hygiene, tuberculosis and mental hygiene.

Establishment of Blood Bank Approved.—The establishment of a statewide blood bank under the auspices of the state department of health, the state medical association and the county medical societies has been approved. Funds have been obtained with the understanding that it will be lent for use in blood bank areas. Medical societies within such major areas will control the bank with the understanding that hospitals will not be permitted to make a profit from it. The blood and plasma will be sold at a reasonable cost to maintain the bank. The plan will work in with the civilian defense banks now in existence, thereby utilizing stock now on hand and replacing it continuously within a sixteen day period, after which it will be converted into plasma.

WISCONSIN

State Director Named for Infantile Paralysis Program.—Mr. Palmer F. Daugs, Lakemills, chairman of the Jefferson County chapter of the National Foundation for Infantile Paralysis, has been appointed state representative to direct the program of the National Foundation in Wisconsin. Mr. Daugs will act as coordinator between the National Foundation and the seventy-one county chapters.

Stanley Seeger Honored.—The amphitheater of the Milwaukee Children's Hospital has been named in honor of Dr. Stanley J. Seeger, Texarkana, Texas, vice president of the American Medical Association and formerly chief of staff of the hospital. The amphitheater was erected largely through the efforts of Dr. Seeger while in service at the hospital. On June 8 a plaque was unveiled in the amphitheater during ceremonies attended by Dr. Seeger, and the room was dedicated to bear his name.

GENERAL

Dr. Kelly Resigns as Secretary of Pharmaceutical Group.—E. F. Kelly, Phar.D., since 1926 secretary of the American Pharmaceutical Association, has resigned. A successor has not been named.

New Hospital Library Group Formed.—The Special Libraries Association formed a new national Group of Hospital and Nurses' Librarians within its organization during its annual conference, June 19-21, in Philadelphia, as a result of a petition submitted by hospital librarians. Miss Ruth Tews, head of the hospital library service of the St. Paul Public Library, was appointed chairman. The new group will give all librarians working in hospitals opportunity for active participation in the national development of their work, in the determining of standards, in the consideration of publications and in general extension of their services. Those interested in receiving the first News Letter of the new group should communicate with Miss Tews, Hospital Service, St. Paul Public Library, St. Paul 2, Minn.

National Medical Association.—The fiftieth annual convention of the National Medical Association will be held at the Sumner High School, St. Louis, August 14-17, under the presidency of Dr. Thomas M. Smith, Chicago. Included among the speakers will be:

Dr. John W. Lawlah, Washington, D. C., Supply and Demand of Negro Physicians as Related to Present War Emergency.
Dr. Harvey N. Middleton, Indianapolis, Diagnosis and Prognosis of Bundle Branch Block.
Dr. Herbert J. Erwin Jr., St. Louis, A Report of 100 Cases of Fever Therapy in Neurosyphilis.
Dr. Leonidas H. Berry, Chicago, Value and Mechanism of Certain Drugs in Gastrointestinal Disorders.
Dr. Charles R. Merry, St. Louis, Recent Advances in the Treatment of Burns.

The preliminary program includes many other speakers and representatives of the armed services. Dr. George A. Moore, Roanoke, Va., will discuss "Socialized Medicine" at the general closing session. On August 15 Dr. Charles R. Drew, Washington, D. C., winner of the 1944 Spingarn Medal (THE JOURNAL, April 22, p. 1212) will deliver the fourth annual oration in surgery, on "The Evolution of the Plasma Bank."

Incidence of Poliomyelitis and Other Diseases.—Four hundred and eighty cases of poliomyelitis were recorded during June for the country as a whole, according to a release from the Office of War Information, July 17, issued for the U. S. Public Health Service, Federal Security Agency. One hundred and thirty occurred in North Carolina, where the outbreak is localized in west central counties of the state and 55 in Kentucky. No other states have reported figures above normal expectancy. Scarlet fever totals remained at epidemic levels in June, reports for the month showing 11,000 cases as compared with 8,400 in June 1943 and about the same number for normal expectancy. Weekly figures for the month indicated a drop from an estimated 3,000 cases in the first week of June to half that figure in the last week. June, with a total of 113 reported cases of Rocky Mountain spotted fever, was high month for that disease; 61 cases occurred in the South Atlantic states with half of that number reported in Maryland and Virginia. On a nation wide basis, the total cases of Rocky Mountain spotted fever last month exceeded the June 1943 figures by twenty. The total of 170 cases reported in the first half of this year were approximately 20 less than in the same period of 1943. Although still epidemic, meningococcic meningitis is now in its seasonal decline. Totals for the June record 1,100 cases against 1,500 for the same period of last year. The disease has been epidemic for the past two years, according to the report, with high rates in the winter months and recessions in the summer.

LATIN AMERICA

Health Activities in Latin America.—*Disbursement of Health Funds.*—A total of $1,130,000 has been allotted to the Puerto Rico Department of Health for the development of public and maternal health programs. Distribution of the fund will include $68,000 for the federal program of crippled children, maternal and child care service, $200,000 for the antivenereal program, $315,000 for public health, $40,000 for social work and $282,000 for title VI of the Social Security Program. Puerto Rico will provide $40,000 for crippled children, $100,000 for maternal and child care, $75,000 for the antivenereal program and $10,000 for social service.

Typhus Situation Serious.—The recent increase in typhus in San Juan constituted "near epidemic proportions," according to the department of health of Puerto Rico. An average of 12 cases a month were reported from January through May of this year, while at the end of the first seventeen days of June 19 cases had been reported. It was hoped that the "clean up campaign," which was begun June 18, would assist in improvement of sanitary conditions in San Juan.

Funds for Nursing Care.—The insular emergency council of Puerto Rico has approved the employment of 130 public health nurses at $1,200 a year each, for twelve months starting July 1. An appropriation of $156,000 was approved from war emergency program funds to pay the salaries. The council also approved the use of $35,340 at the School of Tropical Medicine to solve the nursing crisis and an additional $19,008 to meet the requirements of the minimum wage law for unskilled hospital personnel at the University Hospital of the School of Tropical Medicine.

New Construction.—Other projects approved by the insular emergency council of Puerto Rico included the construction of a two story concrete hospital building at Cayey to cost $100,000 and improvements to the Municipal Hospital, poor asylum and city hall building at Mayaguez.

Lottery Funds Used for Tuberculosis Work.—A total of $17,512,710 derived from the "insular lottery" in Puerto Rico has been expended into a ten year period as follows: for tuberculosis hospitals and other expenditures in the antituberculosis campaign, $4,878,958.31; for second and third class municipalities, $2,482,721.03 for welfare services; for charity district hospitals, $2,311,753.66, for maintenance and operations of these hospitals.

Regulation on Hospital Admission of Patients.—A new regulation has been approved in Puerto Rico providing that admission of patients to the various services in the district hospitals shall be in accordance with a system of quotas for services in which there shall be assigned to each municipality a number of beds proportional to the number of inhabitants of each municipality, less the number of beds for hospitalization which the corresponding medical service of each municipality may have. The regulation provides further that a reserve of 40 unassigned beds shall be made in each hospital for emergency and isolation cases. Further provisions cover the applications for admission and the investigation of qualifications for admission. Persons whose annual income is not greater than $1,000 in case they have dependents, and $500 if they have not, shall be considered as deserving persons. Except in cases of emergency hospitalization, all admissions to hospital shall be made through the dispensary of the hospital.

Society of Kellogg Fellows.—The organization of the Society of Kellogg Fellows was recently announced. Named in honor of the founder of the Kellogg Foundation, the society aims to stimulate professional and educational activities of Latin American ophthalmologists. Dr. Harry S. Gradle, Chicago, was chosen honorary president. Members of the society are all Latin American ophthalmologists who have carried on postgraduate studies in their specialty through the aid of the W. K. Kellogg Foundation and the Pan American Congress of Ophthalmology. Members of the organizing committee are Drs. Daniel Silva, Mexico, Agustin Perret, Venezuela, and Manoel A. da Silva, Brazil. The final steps to complete the organization will be taken during the annual meeting of the American Academy of Ophthalmology and Otolaryngology in Chicago, October 8-12. *Ophthalmologia Ibero-Americana* has been designated the official journal of the society.

Special Society Elections.—Dr. Antonio Cândido de Camargo was elected president of the Associação Paulista de Combate ao Cancer for 1944, Drs. Luiz do Rego and Oscar Monteiro de Marros, vice presidents and Dr. Paulo Tibiriçá general secretary.——Dr. Alberto Inclán Costa was named president of the Sociedad Cubana de Ortopedia y Traumatologia recently, Dr. Rafael Peñalver vice president and Dr. Luis Iglesias de la Torre secretary; all are from Havana.

Physician Candidate for President.—Dr. Ramon Grau San Martin, who served as president of Cuba for a time in 1933, again is a candidate for the position.

Deaths in Other Countries

Dr. Johan Harald Ernberg, private physician to King Gustaf of Sweden, died in Stockholm, May 26.——**Dr. Carlos Eduardo Finlay Shine,** formerly secretary of health and professor of medicine at the University of Havana, Cuba, died March 11, aged 76. Dr. Finlay was the son of Carlos J. Finlay, pioneer in yellow fever research. He graduated at Columbia University College of Physicians and Surgeons in 1889. Dr. Finlay had been professor of ophthalmology at the University of Havana since 1907 and had served as dean of the medical school for a year in 1934.

Foreign Letters

LONDON

(From Our Regular Correspondent)

July 1, 1944.

Criticisms of the National Health Service Scheme

In a letter to the *Times* the president of the Royal College of Surgeons, Sir Alfred Webb-Johnson, points out that a grave defect in the government scheme for a national health service is that the medical profession is not given any direct responsibility for its planning and administration. The physicians are relegated instead to an advisory status, and their advice is not to be made available to the public. They can be of greater service as collaborators than as critics, the letter states. Moreover, their advisory functions at the center are robbed of much of their value by the fact that the medical advisers are to be chosen by the minister of health and not by the profession, although several members of the present advisory committee are ex officio members and so speak in a representative capacity. At the periphery again their function is advisory, but much more efficient planning and administration will be achieved if the profession and voluntary hospitals are made responsible partners in these tasks.

It is also in the people's interest that the freedom of the profession be maintained. Independent practice is a large factor in ensuring this freedom, for it leaves a considerable number of practitioners at liberty to state their views freely and publicly without regard to departmental approval. The continuance of independent medical practice can be ensured by not including in the service those above a certain limit of taxable income who are able and anxious to pay for services as required, it is suggested. Another important way of maintaining the freedom of the profession is avoidance of whole time salaried appointments where they are unnecessary. Contributors could still have the doctor of their choice. The hospital service is a different matter; being an organization of specialist services, it is more suitably provided out of rates and taxes.

There is a proposal to vest in a Central Medical Board—a body of civil service structure appointed by the Ministry of Health—the power to prevent a practitioner from offering his services to public patients in any district of his choice. It is not proposed that he should be prevented from practicing there but only that he should not be allowed public patients. Thus these people would be refused free choice of doctor. It is also proposed to require newly qualified doctors to accept whole time public service for a term of years in order to secure an adequate number for unattractive areas. This is a definite encroachment on the freedom of the citizen, it is maintained.

Rectal Pain

In *Guy's Hospital Reports* Prof. J. A. Ryle has made an important clinical contribution on the subject of rectal pain. He emphasizes the fact that, as Hilton pointed out, pain is often absent altogether in carcinoma of the rectum. This has led repeatedly to delayed and faulty diagnosis. In a series of 28 cases Ryle found pain absent in 8; in another 10 there was abdominal pain (colonic pain above the level of the growth) but no rectal pain, while in the remaining 10 there was pain or discomfort referred to the rectum itself. Thus true rectal pain was found in a little over a third of the cases. A sense of pressure or ineffectual calls to stool may be described, but frequently, urgency, looseness and blood in the stools are more constant and valuable signs than pain. Bladder irritation and referred pains in the testicles, the hip or down the back of the legs are secondary effects, indicating extensions of the growth and therefore late symptoms. Of the local rectal sensations "a sort of toothache in the rectum," "occasional sharp, shooting pains" and "an obstructed feeling, not pain" were descriptions given by 3 patients. The most severe pain is encountered in cases in which the growth invades the anal canal; in these circumstances there is pain on defecation.

The other more important causes of rectal pain are ball valve accumulation of hard feces, tabes dorsalis and nervous proctalgia. In ball valve accumulation the subjects are usually elderly or bedridden, and a recent history of gastric hemorrhage, other dehydration or a barium meal examination is common. Blood or barium sulfate give the requisite firmness and stickiness to the impacted mass to prevent ready evacuation. In hospital cases the cause of the symptoms escaped the recognition of house officers and ward sisters. The pain is likened to labor pains and is described as a "bearing down" pain, which may occur rhythmically. The diagnosis is made by digital examination. In nervous proctalgia there is rectal spasm. The pain starts as a dull ache but rises rapidly to an agonizing form. It is commonly nocturnal and awakens the victim at about 2 a. m. It is frequently associated with fatigue or anxiety and may be associated with sexual excitation. Relief has been obtained by rapid inflation of the bowel with air or by the injection of water. A hot bottle applied to the sacrum may also give relief.

Rapid Treatment of Wounded

The speed with which the war wounded receive medical aid has been described in previous letters and is further illustrated in the Normandy campaign. Surgeons went in with the first waves—with the parachutists and glider troops and in the assault boats. Men were given skilled attention within a few minutes of being hit. Specialized teams carried penicillin, whole blood and plasma into the front lines. During the first few days the wounded in the inland fighting were brought to the beaches in jeeps and later in motor ambulances, placed in "ducks" and run into tank landing craft, which brought them to England. As soon as the vessels bringing tanks from England were unloaded on the beaches they were prepared to receive the wounded, and an emergency operation theater was rigged up. From the moment a man was picked up in the field he was watched over by doctors, surgeons and transfusion experts. Yellow tabs were tied to the wounded taking penicillin, so that further doses could be given as they passed along the evacuation service; red tabs were tied on men taking sulfonamides. During the first day or two 400 bottles of blood were sent across the English channel daily by motor launch, but as the number of casualties was smaller than was expected this supply was cut down. Blood banks were established behind the beaches.

Psychologic Clinic Established at Guy's Hospital

The opening of the York Clinic for Psychological Medicine at Guy's Hospital is a new departure. It is the first clinic of its type in this country specially built at a general hospital as part of a great teaching school. Over twenty years ago the Middlesex Hospital made a pioneer move when, by arrangement with St. Luke's Hospital for Mental Diseases, a small unit was formed at the main teaching hospital for psychologic patients. The Guy's Clinic has been designed in accordance with the best modern experience and has beds for 43 patients. An advantage of the conjunction of a large general hospital with a special unit for mental diseases is that it will encourage sufferers to overcome their usual reluctance to submit themselves to treatment. Moreover, the education of medical students has suffered from the absence of a psychologic department specially built apart from the ordinary hospital. A donation of $215,000 from the York Trust in conjunction with a gift of half the site by Lord Nuffield has made this project possible.

BRAZIL

(From Our Regular Correspondent)

June 24, 1944.

Treatment of Osteoarthritis by Parathyroidectomy

The late results of the treatment of osteoarthritis by thyroidectomy were studied by Dr. Sebastião Hermeto Junior of the Faculty of Medicine of the University of São Paulo. He emphasized the necessity of correct diagnosis based on an accurate clinical examination of the patient and on careful analysis of roentgenograms and laboratory findings. Dr. Hermeto Junior reported 20 cases with varying forms of osteoarthritis, including some cases of spondylosis. The operation performed in these cases was unilateral parathyroidectomy; 6 patients were operated on a second time in order to reach another gland. The late results are no improvement in 6 cases, improvement in the pain and of the joint block in 10 cases and good results in 4 cases. One of the latter presented before surgical treatment a pathologic condition of one of the severest anatomic forms that the author had ever seen. Dr. Hermeto Junior thinks that parathyroidectomy has favorable indications for treating osteoarthritis.

Narrowing of the Esophagus Caused by Lye

Dr. J. A. Arruda Botelho, endoscopist of the Beneficiencia Portuguesa de São Paulo, has described a new technic by which he has obtained good results in all cases of narrowed esophagus due to lye which he has treated. There were 15 patients. The process consists in using the dilator of Plummer-Jackson after the patient has submitted to a previous gastrostomy. The gastrostomy permits a conducting thread to extend from the mouth to the gastrostomy, permitting the dilator to slide by the thread, dilating the esophagus its full length. The conducting thread, well stretched, permits a forced dilatation without any danger whatever to the patient, because the point of the dilator adapts itself to all the irregularities of the esophagus.

After the dilation is completed, in about three months the author begins to use the esophagoscope of Chevalier Jackson to maintain the dilatation until the esophagus is completely healed.

The only difficulty with this procedure consists in passing the thread from the mouth to the gastrostomy, and it is just this which makes the method original and guarantees its efficiency and harmlessness.

When the narrowing is not fully closed, the patient can be made to swallow a fine linen thread, and by simple suction this passes through the gastrostomy. Joined to this fine thread is a thicker one which is necessary for the dilation. If the thread will not pass by swallowing, the esophagoscope of Chevalier Jackson must be used.

Brief Items

Dr. Estellita Lins, a practicing surgeon of Rio de Janeiro and a graduate from the emergency course in military medicine, has been called to active service in the army. Dr. Estellita Lins has a good background in war surgery, as he served during the first world war in France at the Paris Hospital Vaugirard.

An association of physicians working in hospitals, sanatoriums and allied institutions has recently been organized. The governing board of the association includes Dr. Edgard de Almeida, Dr. João Borges Filho and Dr. E. Carlos Carvalho.

A School of Hygiene and Public Health has been created at the University of São Paulo as a development of the course in hygiene and public health run by the Institute of Hygiene of the university. The late malariologist Dr. Samuel T. Darling and Dr. W. G. Smillie, professor of public health at Cornell Medical College, both taught in São Paulo during the early years of the course in hygiene and public health. Dr. Geraldo Paula Souza, professor of hygiene at the University of São Paulo, now commissioned in Washington, has been a leading professor of the course and is expected to be the dean of the new school.

The National Academy of Medicine of Rio de Janeiro has recently created a medal prize under the name of Dr. Rocha Vaz, to be awarded every year to the best paper from a Brazilian author concerning human constitution, endocrinology and metabolism.

Dr. Christopherson and the Special Service of Public Health

Dr. E. H. Christopherson, superintendent of the Brazilian Special Service of Public Health, arrived in Rio de Janeiro recently, back from a trip to the United States, where he presented a detailed report of his work to Gen. George C. Dunham, director of the Division of Health of the Office of the Coordinator of Inter-American Affairs. As reported in a previous letter (THE JOURNAL, Sept. 11, 1943) the Special Service of Public Health is an organization created cooperatively by the American and Brazilian governments to take charge of health work in the Amazon basin, where a large number of workers, forming the so-called rubber army, are now subjected to the hazards of many tropical diseases. Dr. Christopherson stopped at Belem, state of Pará, at the mouth of the Amazon River, where he inspected the services located in the neighborhood of that city. Speaking to newsmen on his arrival in Rio de Janeiro, Dr. Christopherson pointed out that perfect cooperation between the American and Brazilian authorities spoke well for the success of the enterprise. He stressed the need for continuing this important health work after the war.

Vaginal Hysterectomy as a Prophylactic Measure In and After the Menopause

From 1932 until 1941, 1,692 women died from cancer of the uterus and 639 from breast cancer in Rio de Janeiro. Thirty cases of vaginal hysterectomy performed in women in the menopause or postmenopause, most of whom were referred for uterine bleeding in nonmalignant states, are reported by Prof. Arnaldo de Morais. Supporting this indication for surgical treatment, different lesions localized in the uterus (procidentia, erosions of the cervix, chronic cervicitis, chronic endometritis, hyperplasia of the endometrium, miomas and uterine atrophy) were found. The role those lesions may display in the incidence of cancer, in connection with personal or hereditary, physiologic and pathologic factors, is emphasized.

From his study the author concludes that vaginal hysterectomy, performed under local anesthesia, as routinely practiced in his clinic, is indicated when those associated factors are present and when the uterus is already functionless and on account of its lesions must be considered as potentially malignant.

Marriages

GEORGE ANDERSON FOWLER, New York, to Miss Diana A. Skouras at Mamaroneck, N. Y., June 28.

JULIUS E. MONEAGLE, Madison, N. J., to Miss Dorothy Phyllis Costabile of New York recently.

ALVIN FRANCIS ST. AMANT, Gonzales, La., to Miss Nancy Webb of Demopolis, Ala., July 8.

PAUL I. KEARNEY, Brooklyn, to DR. GRACE C. VANDERPOEL of Rutherford, N. J., July 1.

JOHN A. WRIGHT JR. to Miss Mary Catherine Campbell, both of Doswell, Va., June 3.

VICTOR G. BALBONI, Boston, to Miss Marjorie Fletcher in New York, June 17.

CHARLES SHORNSTEIN to Miss Estelle Hartman, both of New York, July 2.

Deaths

William Alexander Lambeth, Charlottesville, Va.; University of Virginia Department of Medicine, Charlottesville, 1892; served as instructor in physical culture, director of the Fayerweather Gymnasium, lecturer on hygiene and materia medica, adjunct professor and professor of hygiene and materia medica and professor of hygiene at his alma mater; also superintendent of buildings and grounds from 1905 to 1928; secretary of the general athletic association of the University of Virginia from 1897 to 1921; vice president of the department of physical education at the Chicago Exposition in 1893; member of the American College Directors Association and in 1896 vice president; member and from 1897 to 1899 president of the Virginia Intercollegiate Athletic Association; served as treasurer of the National Collegiate Athletic Association; member of the American Olympic Committee for the Stockholm games in 1912; member of the track rules committee of the National Collegiate Athletic Association and a member of the football rules committee from 1908 to 1921; past president of the Society of Directors of Physical Education; chairman of the athletic conference of Southern state universities; member of the American Seismological Society, Raven Society and the American Society of the Royal Italian Orders; decorated a Cavalier in the Order of the Crown of Italy in 1930 and Commendatore in 1933; honorary member of the American Institute of Architects; the Lambeth athletic field at the University of Virginia is named for him; author of "Trees and How to Know Them," "Thomas Jefferson's Achitecture," "Geology of the Monticello Area," "School of Athens" and "Food and Dietetics"; died June 24, aged 76, of heart disease.

Abell Duncan Hardin, Dallas, Texas; Baylor University College of Medicine, Dallas, 1909; member of the State Medical Association of Texas, Dallas Southern Clinical Society and the Texas Ophthalmological and Otolaryngological Society; president of the Dallas Academy of Ophthalmology and Otolaryngology; specialist certified by the American Board of Otolaryngology; assistant professor of clinical otolaryngology and bronchoscopy at the Southwestern Medical College of the Southwestern Medical Foundation since 1943; associate in clinical ophthalmology and otolaryngology at his alma mater 1917-1920, assistant 1920-1924, instructor 1924-1931, instructor in clinical otolaryngology and bronchoscopy 1931-1938 and assistant professor 1938-1943; served as dispensary otolaryngologist and bronchoscopist, Baylor Hospital; died May 10, aged 64.

Isaac Hamilton Browne, Winchester, Ky.; Kentucky School of Medicine, Louisville, 1897; member of the Kentucky State Medical Association; served for eighteen months at Base Hospital number 120 at Tours, France, during World War I and discharged with the rank of captain; served as examiner for the local Selective Service Board during World War II; for many years health officer of the city of Winchester and Clark County; on the staff of the Clark County Hospital; served as surgeon for the Louisville and Nashville and the Chesapeake and Ohio Railroad companies; a charter member of the Rotary Club; died in the Veterans Administration Facility, Lexington, June 19, aged 67, of gangrene of the lower extremities and general arteriosclerosis.

Adolph Hartung ✠ Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1908; professor of radiology at his alma mater, now known as the University of Illinois College of Medicine; specialist certified by the American Board of Radiology, Inc.; member of the American Roentgen Ray Society, Radiological Society of North America, Inc., and the American College of Radiology; formerly on the staffs of the Alexian Brothers', Cook County, Policlinic and Henrotin hospitals; consultant, Women and Children's Hospital; on the staff of the Research and Educational Hospitals, University of Illinois, where he died May 29, aged 61, of coronary stenosis.

Louis Curtis Ager, Warner, N. H.; Long Island College Hospital, Brooklyn, 1893; member of the New Hampshire Medical Society; at one time instructor in pediatrics at his alma mater; past president of the Brooklyn Pediatric Society; formerly served with the city health department of Brooklyn; formerly on the staffs of the Potts Memorial Institute, Livingston, N. Y., Veterans Administration Facility, Rutland Heights, Mass., Long Island College Hospital, Kingston Avenue, Norwegian and St. Mary's hospitals, Home for Consumptives and the Home for Friendless Women and Children, all of Brooklyn; died May 18, aged 75, of a self-inflicted bullet wound.

Theodore F. Heavenrich ✠ Port Huron, Mich.; Detroit College of Medicine, 1900; past president of St. Clair County Medical Society; formerly councilor of the Seventh District of the Michigan State Medical Society; served as surgeon for the Rapid Railway System and Detroit United Railway and as assistant surgeon for the Pere Marquette Railway; formerly medical examiner for various insurance companies; physician and surgeon for the Port Huron Sulphite and Paper Company and the Detroit Edison Company; on the staff and formerly medical director of the Port Huron Hospital, where he died May 5, aged 69, of heart disease.

Charles Benjamin Yost ✠ Bloomsburg, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1910; served as president and secretary of the Columbia County Medical Society; secretary of the Bloomsburg Board of Health; during World War I a medical examiner of the exemption board in District number 1, and served in the medical corps of the U. S. Army; member of the Selective Service System during World War II; a charter member of the Kiwanis Club; medical director of Columbia County Red Cross; on the staff of the Bloomsburg Hospital, where he died June 28, aged 56, of cerebral hemorrhage.

Lawrence Chamberlain Grosh ✠ Toledo, Ohio; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1896; specialist certified by the American Board of Internal Medicine; served as a captain in the medical corps of the U. S. Army during World War I; instrumental in building the Toledo Hospital in 1931, serving as chief of staff for twelve years; active in the completion of the Toledo Hospital Institute for Medical Research in 1942; died July 6, aged 73, of hemorrhage from the internal mammary artery caused by a fracture of the sternum, which was due to osteoporosis.

Rush Leslie Burns, Los Angeles; Rush Medical College, Chicago, 1906; fellow of the American College of Surgeons; for many years city and county health officer in Two Harbors, Minn., where he had been one of the physicians in charge of the Burns and Christensen Hospital and served as chief surgeon for the Duluth and Iron Range Railroad and assistant chief surgeon, Duluth, Missabe and Northern Railroad Company; formerly part owner and physician in charge of the Soudan Hospital, Soudan; died in Santa Monica Hospital, Santa Monica, May 9, aged 66, of cirrhosis of the liver.

Richard Edward Albert, Portsmouth, Va.; University of Virginia Department of Medicine, Charlottesville, 1919; member of the Medical Society of Virginia; on the staffs of the Parrish Memorial Hospital and the King's Daughters' Hospital, where he died May 30, aged 48, of left hemiplegia, arteriosclerosis and malignant hypertension.

Charles K. Albertson, Benton, Pa.; Maryland Medical College, Baltimore, 1907; member of the Medical Society of the State of Pennsylvania; past president of the Columbia County Medical Society; on the staff of the Bloomsburg Hospital, Bloomsburg, where he died May 8, aged 60, of peritonitis and perforated appendicitis.

Irving Sydney Barcham ✠ New York; New York University Medical College, New York, 1935; diplomate of the National Board of Medical Examiners; assistant adjunct surgeon, Hospital for Joint Diseases, where he died May 28, aged 34, of essential hypertension and cerebral hemorrhage.

Samuel Graham Bay, Santa Monica, Calif.; Ohio Medical University, Columbus, 1898; member of the California Medical Association; formerly passed assistant surgeon, U. S. Public Health Service reserve; served during World War I; on the staff of the Veterans Administration Facility, West Los Angeles, where he died May 18, aged 67, of heart disease and arteriosclerosis.

James S. Bingham, Middlesboro, Ky.; University of Louisville (Ky.) Medical Department, 1885; served three terms as county judge and one term as county court clerk; died in the Pineville Community Hospital, Pineville, May 29, aged 82.

William Purnell Bond, Ruston, La.; Memphis (Tenn.) Hospital Medical College, 1901; member of the Louisiana State Medical Association; died in the Ruston-Lincoln Sanitarium May 5, aged 74, of cerebral embolism.

Stanley James Bown, Richwood, Ohio; Starling Medical College, Columbus, 1898; served as secretary and treasurer of the Union County Medical Society; died May 16, aged 71, of cerebral hemorrhage.

Charles Henry Brush, Kings Park, N. Y.; Fordham University School of Medicine, New York, 1913; first lieutenant

in the medical corps of the U. S. Army during World War I; assistant director, Kings Park State Hospital; died May 29, aged 55, of coronary occlusion.

Edward David Burns, Arlington, Mass.; Tufts College Medical School, Boston, 1936; served an internship at the Carney Hospital, South Boston, and St. John's Hospital, Lowell, and a residency in the Sanatorium Division of the Boston City Hospital; commissioned a first lieutenant in the medical corps reserve on June 15, 1936 and reappointed a captain, Army of the United States, on June 17, 1942; released from service Feb. 25, 1943; died in the Baker Memorial Hospital, Boston, June 19, aged 34.

Oliver Llewellyn Butterick, Toledo, Ohio; University of the City of New York Medical Department, New York, 1887; died May 3, aged 82, of cardiac asthma.

John Joseph Cochran, Natick, Mass.; Harvard Medical School, Boston, 1923; member of the Massachusetts Medical Society; councilor for the Middlesex South District Medical Society; associate examiner, local Selective Service Board number 105; surgeon on the staff of the Leonard Morse Hospital, where he died May 1, aged 47, of bronchopneumonia and bronchial asthma.

Fountain Lee Cook, Independence, Mo.; University Medical College of Kansas City, 1897; member of the Missouri State Medical Association; health officer of Independence; on the staff of the Independence Sanitarium and Hospital; died May 23, aged 80, of acute cardiac dilatation and congestive heart failure.

Fred Sutton Cook, Eau Claire, Wis.; State University of Iowa College of Medicine, Iowa City, 1907; member of the State Medical Society of Wisconsin; died July 4, aged 62, of myelogenous leukemia.

William Bryant Cutts, Providence, R. I.; University of Pennsylvania Department of Medicine, Philadelphia, 1899; member of the Rhode Island Medical Society; fellow of the American College of Surgeons; past president of the Providence Medical Society; during World War I served as a surgeon at the U. S. Army General Hospital at Fort McHenry, Md., with the rank of captain; associate surgeon, Homeopathic Hospital; for many years on the staff of the Rhode Island Hospital, where he died May 24, aged 75.

Homer Jury Davis ✠ Newark, Ohio; Rush Medical College, Chicago, 1904; fellow of the American College of Surgeons; past president of the Licking County Medical Society; member of the board of directors and second vice president of the Ohio Society for Crippled Children; physician for the Licking County Children's Home; chief of staff, Newark City Hospital; surgeon, Pennsylvania and Baltimore and Ohio railroads; died in the Mount Carmel Hospital, Columbus, May 6, aged 67, of perforated duodenal ulcer and peritonitis.

John Woodfin Davis ✠ Tullahoma, Tenn.; University of Tennessee College of Medicine, Memphis, 1935; member of the Medical Association of the State of Alabama; first lieutenant, medical reserve corps, U. S. Army, not on active duty; served as assistant surgeon in the U. S. Public Health Service reserve; died in the University Hospital, Augusta, Ga., May 25, aged 34, of tumor of the spine.

Llewellyn Moore Dykes Sr., Baltimore; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1912; served during World War I; died in Fort Howard May 18, aged 57, of hematemesis and a blood dyscrasia.

Ray Manier Eaton, Rochester, N. Y.; Albany (N. Y.) Medical College, 1911; member of the Medical Society of the State of New York; served as a medical officer with the British Expeditionary Forces in France during World War I; on the staffs of the Rochester General and Park Avenue hospitals; died May 19, aged 56, of coronary occlusion.

Frederick George Eberhard, Three Rivers, Mich.; Northwestern University Medical School, Chicago, 1912; served an internship at the City and County Hospital, Denver; a captain in the medical corps of the U. S. Army during World War I; author of the "Thirteenth Murder" and other mystery stories; died May 31, aged 55, of cerebral hemorrhage.

Sidney Jacob Eichel, Evansville, Ind.; University of Pennsylvania Department of Medicine, Philadelphia, 1898; member of the Indiana State Medical Association; past president of the Ohio Valley Medical Association; died May 14, aged 67, of myocardial degeneration and cardiac asthma.

Charles M. Eisenbeiss, South Bend, Ind.; Kentucky School of Medicine, Louisville, 1892; at one time postmaster of Elkhart and coroner of Elkhart County; formerly vice president of the Indiana State Board of Health; died in the Epworth Hospital, May 3, aged 73, of carcinoma of the bladder.

Lorenzo D. Eley, Plymouth, Ind.; College of Physicians and Surgeons, Keokuk, Iowa, 1887; member of the Indiana State Medical Association; formerly health officer and assessor of the county; served as secretary of the county board of health; died May 14, aged 88, of pulmonary edema, chronic myocarditis and pleural effusion.

James Wade Elphinstone, Pittsburgh; Western Pennsylvania Medical College, Pittsburgh, 1901; member of the Medical Society of the State of Pennsylvania; served on the staff of the Allegheny General Hospital; died May 29, aged 66, of coronary occlusion and hypertension.

Charles Engelke ✠ Waterbury, Conn.; Columbia University College of Physicians and Surgeons, New York, 1902; health officer, 1910-1911; since 1904 on the staff of the Waterbury Hospital, where he died May 22, aged 74, of coronary occlusion.

Harry Howard Flagg, Boston; Tufts College Medical School, Boston, 1908; member of the Massachusetts Medical Society; served in France during World War I; on the staffs of the Chelsea Memorial Hospital, Chelsea, and the Lawrence Memorial Hospital, Medford; died May 25, aged 63, of pernicious anemia and uremia.

George Simeon Fultz ✠ Butterworth, Va.; Medical College of Virginia, Richmond, 1906; member of the board of health and Selective Service Board; surgeon for the Seaboard Air Line; on the staff of the Petersburg Hospital, Petersburg; died May 16, aged 66, of coronary thrombosis.

Nathaniel Howland Gifford, Providence, R. I.; Harvard Medical School, Boston, 1903; member of the Rhode Island Medical Society; for many years a member of the consulting staff of Butler Hospital and chief of surgical service at Charles V. Chapin Hospital; on the staff of the Rhode Island Hospital; died in the Jane Brown Memorial Hospital May 25, aged 65, of coronary thrombosis.

Carlos A. Gooch, Oak Hill, W. Va.; University of Louisville (Ky.) Medical Department, 1898; died in a local hospital July 14, aged 69, of heart disease.

Lee E. Grant, Detroit; Kentucky School of Medicine, Louisville, 1902; specialist certified by the American Board of Otolaryngology; served on the staff of the Grace Hospital; died May 31, aged 73.

George Orbin Hall, Murrysville, Pa.; College of Physicians and Surgeons, Baltimore, 1904; died May 10, aged 69, of coronary occlusion.

William Antoine Hall ✠ St. Louis; Marion-Sims College of Medicine, St. Louis, 1893; formerly professor of physiology at the St. Louis College of Physicians and Surgeons; in 1943 was honored by the St. Louis Medical Society in recognition of his completion of fifty years in the practice of medicine; on the staffs of the Bethesda General Hospital and the Missouri Baptist Hospital, where he died May 28, aged 74, of intestinal obstruction.

Albert Henry Hamel ✠ St. Louis; St. Louis Medical College, 1890; an Affiliate Fellow of the American Medical Association; past president of the Missouri State Medical Association and St. Louis Medical Society; served as member and as president of the state board of health; a captain in the medical corps of the U. S. Army during World I; on the staffs of the Missouri Baptist, Missouri Pacific and the Josephine Heitkamp Memorial hospitals; died May 17, aged 77, of coronary thrombosis.

Jabez Peter Hankins, Orange, Va.; Medical College of Virginia, Richmond, 1908; member of the Medical Society of Virginia; served as secretary and president of the Orange County Medical Society; chairman of the Selective Service Board; member of the Orange County Board of Health; died May 7, aged 64, of coronary thrombosis.

James Clinton Hawkins ✠ Coraopolis, Pa.; Western Reserve University School of Medicine, Cleveland, 1915; served as a captain in the medical corps of the U. S. Army during World War I; on the staff of the Sewickley Valley Hospital, where he died May 24, aged 55, of coronary occlusion.

Moses W. Hoge ✠ St. Louis; St. Louis Medical College, 1883; an Affiliate Fellow of the American Medical Association; formerly an instructor in neurology and chief of clinic

for nervous diseases at the Washington University School of Medicine; died in Farmington, Mo., May 5, aged 83, of arteriosclerosis.

Greg Hoskins ✠ Long Beach, Calif.; Cooper Medical College, San Francisco, 1910; served during World War I; president of the Harbor Branch of Long Beach Academy of Medicine; on the staff of the Seaside Hospital, where he died May 10, aged 57, of nephritis.

Carl Adolph Huber ✠ Rochester, N. Y.; College of Physicians and Surgeons, New York, 1894; at one time coroner's physician; served as examining physician for local draft board number 551 for three years; consulting surgeon at the Monroe County Infirmary; member of the board of directors and consulting surgeon at the Park Avenue Hospital, where he died May 31, aged 71, of cerebral hemorrhage.

Robert E. Innis, Marion, Ind.; Eclectic Medical Institute, Cincinnati, 1886; also a pharmacist; died in the Marion General Hospital May 9, aged 83, of coronary occlusion.

Theron Skeels Jackson ✠ Cleveland; Western Reserve University School of Medicine, Cleveland, 1913; fellow of the American College of Surgeons; served in France with the Lakeside Unit as a captain in the medical corps during World War I; served on the staffs of the Huron Road Hospital, East Cleveland, and the Woman's and St. Vincent Charity hospitals; died May 31, aged 58, of coronary disease.

Edward Lyon Sr., Williamsport, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1897; member of the Medical Society of the State of Pennsylvania; past president of the Lycoming County Medical Society; veteran of the Spanish-American War; a medical examiner on the draft board during World War I; served as a school director and a member of the city council; on the staff of the Williamsport Hospital; died in the Veterans Administration Facility, Coatesville, May 4, aged 69.

Alberta Helen Murwin Miners, St. Joseph, Mich.; the Hahnemann Medical College and Hospital, Chicago, 1903; died May 6, aged 74, of chronic nephritis.

Arvel R. Ponton ✠ Fort Worth, Texas; University Medical College of Kansas City, Mo., 1906; formerly one of the operators of the Ponton-Brown Hospital, Edinburg, now known as the Grandview Hospital; head of Ponton Clinic; died in the Methodist Hospital April 11, aged 59, of injuries received when his horse fell and rolled over him.

Walter McClellan Smalley, Dayton, Ohio; Fort Wayne College of Medicine, Fort Wayne, Ind., 1889; at one time medical supervisor for the Miami conservancy district; died May 1, aged 82, of heart disease.

Theodore Sureth, Scranton, Pa.; New York Homeopathic Medical College and Hospital, New York, 1893; member of the Medical Society of the State of Pennsylvania; one of the founders and president of the staff of the Hahnemann Hospital; a director of the North Scranton National Bank; died May 6, aged 83, of cerebral hemorrhage due to cardiovascular disease.

Harry Lee Upshaw, Social Circle, Ga.; Emory University School of Medicine, Atlanta, 1915; member of the Medical Association of Georgia; served in France during World War I; for many years local surgeon for the Georgia Railroad; died April 6, aged 50, of cirrhosis of the liver.

Edward Joseph Van Metre, Tipton, Iowa; Rush Medical College, Chicago, 1886; served on the staffs of St. Luke's Methodist Hospital, Cedar Rapids, and University Hospital, Iowa City; surgeon for the Rock Island Railroad; died June 16, aged 83, of hypertensive heart disease and general arteriosclerosis.

De Ver Oram Williams, Durhamville, N. Y.; University of the City of New York Medical Department, New York, 1885; died July 6, aged 81.

John Mill Wright ✠ Grand Rapids, Mich.; Detroit College of Medicine, 1895; at one time instructor at the Grand Rapids Medical College; formerly secretary of the Kent County Medical Society; served as county coroner and as a member of the board of education; chief of staff, Evangeline Home; staff visiting physician, St. Mary's Hospital, where he died April 27, aged 69, of coronary thrombosis.

Oscar Olie Young, Baldwin Park, Calif.; Kansas City (Mo.) Medical College, 1896; served during World War I; major, medical reserve corps, U. S. Army, not on active duty; died in the Veterans Administration Facility, West Los Angeles, April 9, aged 75, of retroperitoneal fibrosarcoma with generalized metastases and bronchopneumonia.

DIED WHILE IN MILITARY SERVICE

Martin Batts Jr., Grand Rapids, Mich.; University of Michigan Medical School, Ann Arbor, 1933; member of the Michigan State Medical Society and the American Academy of Orthopaedic Surgeons; fellow of the American College of Surgeons; served an internship and later residency in surgery and orthopedics at the University of Michigan Hospital, Ann Arbor; formerly fellow in surgery at the Mayo Foundation, Rochester, Minn.; served on the consulting staff of St. Mary's Hospital and on the staffs of the Butterworth and Blodgett Memorial hospitals; commissioned a captain in the medical corps of the Army of the United States on July 30, 1942; later promoted to major; died in the Percy Jones General Hospital, Battle Creek, July 8, aged 36, of acute myelogenous leukemia.

Merrick Roblee Breck ✠ Chicago; Rush Medical College, Chicago, 1924; served an internship at the Kings County Hospital, Brooklyn; on the attending staff of the Ravenswood Hospital; formerly on the staff of the Atchison, Topeka and Santa Fe Railroad Hospital, La Junta, Colo.; commissioned a first lieutenant in the medical reserve corps of the U. S. Army on Dec. 3, 1931; subsequently promoted to captain, major and lieutenant colonel; drowned in New Guinea June 9, aged 44.

William Elijah Moore Devers ✠ Colonel, M. C., U. S. Army, Cowles, Neb.; University of Illinois College of Medicine, Chicago, 1914; U. S. Army Medical School, 1921; hospital apprentice, first class, in the U. S. Navy from May 12, 1905 to May 24, 1909; second lieutenant, Fourth Infantry, South Dakota National Guard in 1909; first lieutenant and battalion adjutant from August 1911 to June 1914; served during World War I; entered the medical corps of the U. S. Army as a captain in 1920, promoted to major in 1929, a lieutenant colonel in 1937 and later a colonel; died in the Army and Navy General Hospital, Hot Springs National Park, Ark., March 30, aged 59, of carcinoma of the stomach.

William Francis Drew, San Francisco; Stanford University School of Medicine, San Francisco, 1941; served an internship at the San Francisco Hospital; fellow in internal medicine at the Cleveland Clinic Foundation Hospital, Cleveland; commissioned a first lieutenant in the medical corps, Army of the United States, March 10, 1942; died in the North African area May 23, aged 29, of fractured skull received in a fall.

Chapman Q. Dykes, Haines City, Fla.; Emory University School of Medicine, Atlanta, Ga., 1916; member of the Florida Medical Association; past president of the Franklin-Gulf Counties Medical Society; formerly associated with the U. S. Public Health Service; commissioned a captain in the medical corps, Army of the United States, on Aug. 20, 1942 and began active duty on Sept. 4, 1942; later promoted to major; died in Camp Davis, N. C., May 3, aged 51, of cerebral hemorrhage, pulmonary edema and heart disease.

Lewis Jennings Geerlings, Fremont, Mich.; Rush Medical College, Chicago, 1933; completed an internship at the Presbyterian Hospital, Chicago; member of the Michigan State Medical Society; served as president of the Newaygo County Medical Society; began active duty as a first lieutenant in the medical corps, Army of the United States, on May 16, 1942; later promoted to captain; a flight surgeon in the air corps; killed in an airplane crash while on a routine flight from one air base to another at Corsica, May 10, aged 36.

Charles David Horn, Baltimore; Harvard Medical School, Boston, 1941; served an internship and residency at the Sinai Hospital; commissioned a first lieutenant in the medical corps, Army of the United States, on Sept. 24, 1942; died Aug. 11, 1943, aged 26, of a broken neck received in a motor vehicle accident.

Jack Kinell, Houston, Texas; University of Kansas School of Medicine, Kansas City, 1936; member of the State Medical Association of Texas; served an internship in the City Hospital, Cleveland, and a fellowship in internal medicine at the Cleveland Clinic Foundation Hospital; commissioned a lieutenant (jg) U. S. Naval Reserve on March 21, 1942 and began active duty on April 19, 1942; promoted to lieutenant March 1, 1943; served for twenty months in the South Pacific; died in the Naval Air Station at Corpus Christi April 15, aged 31.

Bureau of Investigation

STIPULATIONS

Agreements Between Federal Trade Commission and Promoters of Various Products

Following are abstracts of stipulations in which promoters of "patent medicines," medical devices and cosmetics have agreed, following action by the Federal Trade Commission, to discontinue certain misrepresentations in their advertising. These stipulations differ from the "Cease and Desist Orders" of the Commission in that such orders definitely direct the discontinuance of misrepresentations. The abstracts that follow are presented primarily to illustrate the effects of the provisions of the Wheeler-Lea Amendment to the Federal Trade Commission Act on the promotion of such products:

Bio-Mineral.—Michel Manteris and George Aristotle, who put out this product under the firm name Bio-Mineral Products Company, Detroit, stipulated with the Federal Trade Commission in August 1943 that they would discontinue the following advertising misrepresentations: That this product is an adequate or dependable remedy, treatment or relief for a number of ailments including tuberculosis, cancer, heart disease, goiter, infantile paralysis, arthritis and sciatica; that Bio-Mineral contains an effective amount of any mineral recognized by medical science as a preventive of, or treatment for, any of the disorders that the promoters mention, or that the preparation is drugless and that its use will assure health; that it will aid in restoring a ruined, weak or sick body, or be of benefit in anemic conditions, except such as result from uncomplicated iron deficiency; that it will have a general tonic effect on the body or be a body builder, that it is rich in minerals or contains a significant amount of any mineral other than iron.

Blis-To-Sol.—This is a product of the Central Pharmacy, Inc., trading as Blis-To-Sol Company, Fitzgerald, Ga. In June 1943 the concern entered into a stipulation with the Federal Trade Commission, agreeing to cease representing that the preparation is a cure or remedy for eczema, poison oak or poison ivy, or that it has any value in the treatment thereof, in excess of affording relief from the symptoms of itching.

"Complete Guide for the Deafened."—In June 1943 one Benjamin H. Levine, trading as Harvest House, New York, which distributes this book, entered into a stipulation with the Federal Trade Commission in which he agreed to cease representing that the work contains directions of such nature that merely by following them the sense of hearing will be improved, saved or restored, or that it contains directions of such nature that they can be followed without assistance or direction by a person in the treatment of defective voice or speech. Levine further agreed not to publish or cause to be published any advertisement for the book which might fail to reveal that the volume refers the reader to other sources of information and guidance, as well as to mechanical aids for many of the improvements and for advice as to procedures to be followed in the treatment of deafness.

Groblewski Nostrums.—These are put out by Albert G. Groblewski and Company, Plymouth, Pa., which concern in July 1943 stipulated with the Federal Trade Commission to discontinue any advertisement which failed to reveal that the use of "Groblewski's Headache Powders" may cause collapse, that repeated doses may cause dependence on the drug, that not more than two powders should be taken within 24 hours, and that the preparation should not be given to children; that repeated use of "Groblewski's Nasal Jelly" by aged or debilitated persons or by infants may produce oil injury in the lungs, and that this nostrum should not be used by persons having heart disease or high blood pressure; that "Groblewski's Jadol" is a laxative and should not be taken in the presence of nausea, vomiting, abdominal pains or other symptoms of appendicitis; that frequent use of either "Nervoteine" or "Groblewski's Preparation 'C'" may result in mental derangement or cause skin eruption; that "Groblewski's Powders for Round Worms" contain a laxative and should not be taken when symptoms of appendicitis are present, or used in excess of the recommended dosage; that castor oil or foods or other preparations containing oil or fat should not be used while such powders are being taken, and that the prescribed dose should not be used if there is discharge from the ear or if the ear drum is punctured or perforated; and that "Groblewski's Revila Powders" and "Egiuterro" are laxatives and should not be taken when symptoms of appendicitis are observed. The stipulation provided, however, that the statement, "Caution: Use only as directed" would be a sufficient warning in the advertising if the label contained adequate and specific warning as to the potential danger to health.

Hudson Specialties Company's Sun Lamps.—The Hudson concern's name is a trade style used by one Hugo Gernsback of New York, who, in addition to being a publisher, engages in the sale of various electrical and mechanical devices. His lamps, of the carbon arc variety, were supplied to him by manufacturers in Philadelphia and New York. In July 1943 Gernsback stipulated with the Federal Trade Commission to discontinue the following advertising misrepresentations: That the rays produced by his ultraviolet lamp will improve glandular action, give the body nutrition or keep one healthy; that the device should properly be designated "sun lamp"; that the use of infra-red lamps will be an effective means of toning up the system and helping to throw off certain body ailments, or that their use will help nature in its curative powers by forming heat units in the blood, or be of any therapeutic value except as means to supply heat, and then only when heat is not contraindicated. Gernsback further agreed to discontinue any advertising representations which failed to reveal that use of the device in certain contraindicated conditions may result in serious injury to health, and that there is potential danger in the improper use of these. It was provided, however, that if appropriate warnings to this effect are given on the labels, the advertising need contain only the statement: "Caution, Use only as directed."

Polanka and Zielanka.—These preparations are put out by Boleslaw Rosalak and Zenobia Rosalak, trading as Belvedere Products, New York. In July 1943 they stipulated with the Federal Trade Commission that they would discontinue the following advertising misrepresentations: That Polanka will aid the digestive system, regulate the stomach, provide relief for digestive disturbances generally, or have any value other than that of temporarily relieving constipation; that Zielanka will relieve rheumatic, arthritic or muscular pains, be an adequate treatment or effective remedy for such conditions, or offer any value other than that of temporarily relieving constipation. Further, they agreed to discontinue any advertisement which represented that use of either of the preparations is safe, or which failed to reveal the potential danger in their use in the presence of abdominal pains, nausea or other symptoms of appendicitis; provided, however, that if the directions for use given on the label contain an adequate warning of their potential danger, such advertisement need contain only the statement: "Caution: Use only as directed."

R-Q.—In July 1943 the Federal Trade Commission accepted a stipulation from R. Q. Howe, trading as R. Q. Laboratories, Alhambra, Calif. In this he agreed to discontinue the following advertising misrepresentations: That R-Q is a remedy or cure for eczema, poison oak or poison ivy, or a treatment for such conditions aside from affording relief from itching; that it is a treatment for skin infections, without specifying the conditions for which it supposedly has therapeutic value, and that it is a remedy or cure for ringworm, unless it is explained that the product will not destroy deep-seated ringworm infections. Howe further agreed to cease representing, through use of the word "Laboratories" in his trade name, that he maintains or operates a laboratory, and to discontinue any advertisements which failed to reveal that his nostrum may produce skin irritations and that its use should be discontinued as soon as irritation appears. This warning, however, the stipulation permitted him to omit from his advertisements, provided they included the statement, "Caution: Use only as directed" when the same warning appeared on the labels.

Superior Bath Cabinet.—In July 1943 the Cabinet Manufacturing Company, Quincy, Ill., and the Mace Advertising Agency, Inc., Peoria, Ill., stipulated with the Federal Trade Commission that they would cease representing that this cabinet is safe, economical or effective in reducing weight; that it will help to build or maintain resistance against disease; that the use of it tones the skin, restores a rosy flush to sallow skin, purges the pores, stimulates the sebaceous glands and removes impurities from the sweat glands; that it supplies the tissues with new blood and removes toxic substances from the blood stream; that it relieves lumbago, neuralgia, rheumatism and muscle soreness and headaches, breaks up or helps to forestall colds, la grippe and influenza, aids impaired kidney functions, brings relaxation or helps prevent insomnia or nerves. The respondents further agreed to discontinue any advertisements which failed to reveal that there is danger of accidental burn in using the device as directed; that care should be exercised to prevent injury and someone should be in attendance while the cabinet is being used to provide a steam heat bath, a dry heat sweat bath, or as a source of infrared heat, and that exposure to the heat rays may result in a skin burn. The stipulation provided, however, that the statement, "Caution: Use only as directed" would be a sufficient warning in the advertisements if the directions accompanying the cabinet contain a statement to the same effect.

Supertan Ultra-Violet Ray Sun Lamps.—The Ultra Violet Ray Laboratories, Inc., New York, represented in their advertising that these devices were genuine sun lamps and that the radiation that they produced was "the same as in natural sunlight"; that a report on carbon arc lamps by the United States Bureau of Standards confirmed the corporation's claim that its lamps "produce the closest duplication of natural sunshine of any known artificial source of energy," and that the lamps, by means of their radiation, would be beneficial to "rashy, pimply skins," certain forms of anemia, deficiency diseases due to lack of vitamins except vitamin D, tuberculosis of the bones, joints and glands, sinus infections, ulcers, wounds, sore throat, tonsillitis, neuritis and certain skin disorders. In a stipulation that the concern signed with the Federal Trade Commission in June 1943, it agreed to discontinue these misrepresentations and to cease disseminating any advertisement that failed to reveal that excessive exposure to the lamp might result in severe sunburn, and that the device should not be used in cases of pellagra, lupus erythematosus, certain types of eczema, burns and sunburn, and should never be employed unless goggles are worn to protect the eyes. It was provided, however, that if the directions for use of the lamps appear on the label and carry an adequate warning of their potential danger to health, such advertisement need simply warn: "Caution, Use only as directed."

Vita-Brush.—This is an electrically driven device for use on the hair and scalp, and is put out by the Hershey Manufacturing Company of Chicago, whose advertising is handled by George J. Kirkgasser and Leslie A. Drew, trading as Kirkgasser-Drew. In June 1943 both concerns stipulated with the Federal Trade Commission that they would cease representing that the device will check or prevent falling hair or baldness, restore life to dead hair or prevent or ward off dandruff; that it is the secret of healthy hair, is the answer to hair worries or effective for headaches of a circulatory origin; that it has any effect in the treatment or prevention of head colds or congestion, will relieve nervous insomnia, insure a good night's sleep, or cause the hair to grow thicker.

Correspondence

MACROCYTIC ANEMIA OF PREGNANCY

To the Editor:—The rare macrocytic anemia of pregnancy is a serious and incompletely understood disease. Some writers have considered it a form of pernicious anemia, but most observers have been impressed particularly by its resemblance to the hemolytic anemias. My purpose in this communication is to report some recent observations of mine which suggest a plausible explanation for the pathogenesis of this disease.

Long ago Ottenberg and Thalhimer (*J. M. Research* **33**:213, 1915) in transfusion experiments on cats observed that, while the first transfusions were well tolerated, when the transfusions were repeated the recipients eventually developed acute hemolytic reactions followed by a severe erythroblastic anemia. Similarly, in human Rh negative patients who have become sensitized to the Rh factor it has been observed that transfusions of Rh positive blood not only fail to produce a rise in hemoglobin but may cause acute hemolytic transfusion reactions followed by an abrupt drop in hemoglobin (Wiener, A. S., and Peters, H. R.: *Ann. Int. Med.* **13**:2306 [June] 1940. Wiener, A. S.: *Arch. Path.* **32**:227 [Aug.] 1941). These observations can be explained as follows: The blood of every one contains, in addition to the agglutinogens characterizing the individual, one or more agglutinogens shared by all members of the species. Ordinarily an individual does not become immunized or sensitized against antigens contained in his own body, but under certain conditions this principle of "horror autotoxicus" of Ehrlich breaks down. For example, when the sensitized Rh negative patient is given Rh positive blood, he breaks the blood cells down. Then the body in disposing of the broken down cells may occasionally become sensitized to the common species antigens contained in the stroma. The resulting antibodies have the properties of reacting not only with the blood of other individuals of the species but also with the patient's own blood cells (i. e. they are autoantibodies) for the reason that the antigen in question is common to all members of the species. The antibodies then act on the patient's own cells, and a hemolytic anemia results. At times the patient's own broken down cells sensitize him further with resulting continued hemolysis, and unless this vicious cycle is broken death will result.

By extending this principle of "autoimmunization" by transfusion to pregnancy, just as isoimmunization by transfusion was extended to explain transfusion reactions in pregnancy, one arrives at a rather attractive explanation for the macrocytic anemias of pregnancy. If an Rh negative mother becomes oversensitized to the fetus's Rh positive cells, she may also form antibodies to one or more of the common species antigens, and an acute hemolytic anemia could result. In support of this hypothesis may be cited the following clinical facts (Whitby, L. E. H., and Britton, C. J. C.: Disorders of the blood, ed. 4, Philadelphia, Blakiston Company, 1942, p. 244): The disease begins rather abruptly between the sixth and eight months with serious symptoms of anemia and jaundice and other signs of hemolysis. The majority of cases have occurred in multiparas, and there is a tendency to recurrence in future pregnancies. Moreover, most authorities agree with Evans, who says that the anemia, once established, tends to recur in later pregnancies at an earlier date and grows progressively more severe with each pregnancy. These data are strongly reminiscent of erythroblastosis fetalis, and it is very striking that 3 cases that I saw recently all proved to be Rh negative.

Because of the rarity of the disease, it is naturally difficult to compile a large series in a short time. However, these limited findings are so strongly suggestive that it seemed worth while to report them at this time.

A. S. Wiener, M.D., Brooklyn.

BENIGN AND MALIGNANT TUMORS OF THE FOOT

To the Editor:—In commenting on the article by Dr. George V. Kulchar on the treatment of hemangiomas in his article on "Benign and Malignant Tumors of the Foot," which appeared in The Journal, March 18, Dr. C. Russell Anderson (*ibid.*, May 27, p. 302) makes statements that should not go unchallenged.

According to dermatologic opinion, although many such tumors may regress spontaneously, others may grow to unmanageable size and cause considerable disfigurement. If they do regress, residuals may remain. In 1 case of my experience on the head of a child a lesion the size of a finger nail remained untreated and at the end of a year was as large as a grapefruit and required four surgical procedures finally to reduce its blood supply, which at that time was enormous and was sufficient to cause hypertrophy of the child's heart. I would have been derelict in my duty had I advised the family not to have treatment, and it is my contention that early treatment of these cases is by far better than risking the changes brought about by delay.

It is my considered opinion that all angiomas sensitive to radiation should be treated from the day they are discovered if they show any tendency to grow.

Merlin T-R. Maynard, M.D., San Jose, Calif.

TONSILLECTOMY IN POLIOMYELITIS

To the Editor:—The statement in the editorial in The Journal, July 8, that "the discrepancy in the statistics of Page and those of Stillerman and Fischer and of Aycock and others is no doubt due to the method of investigation" is somewhat misleading.

No one has claimed that tonsillectomy is frequently followed by poliomyelitis, nor has any one claimed that poliomyelitis is frequently preceded by tonsillectomy (figures collected to date show that bulbar poliomyelitis following tonsillectomy by an interval corresponding to the incubation period of the disease comprises about 1 per cent of all reported cases of the disease). Tonsillectomy is a common procedure and poliomyelitis a relatively rare occurrence. Page's finding of 1 case following 8,915 tonsillectomies would appear to be entirely consistent with the now generally accepted view that the avoidance of tonsillectomy during prevalence of poliomyelitis prevents the occurrence of numbers of cases of an extremely distressing and highly fatal form of the disease.

To be sure, large numbers of tonsillectomies must be avoided in order to prevent small numbers of cases. But it is the one preventive measure that can be used with assurance in poliomyelitis.

W. Lloyd Aycock, M.D., Boston.

ESTROGENIC SUBSTANCES

To the Editor:—Dr. H. Sheridan Baketel of Reed & Carnrick points out to me that the manner in which the table accompanying my article on the Clinical Use of Ovarian Extracts appearing in the May 6th issue puts one of its preparations in an unfavorable light. It implies that "Estrogenic Substances, R. & C." are made up as vaginal suppositories. Actually, this preparation is used only for oral and parenteral administration.

I am sorry that this error was made, and if it is possible for you to insert a short erratum making this correction it would be appreciated both by the firm concerned and by me.

C. F. Fluhmann, M.D., San Francisco.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Dental Practice Acts: Right of Board to Refuse to Reinstate License Canceled for Failure of Licentiate to Pay Annual Renewal Fee.—Fischwenger was licensed after examination to practice dentistry in Florida in 1925 and as required by law renewed his license, paying the required annual renewal fees, annually thereafter in 1926 and 1927. In the latter year he left Florida, practiced elsewhere and never thereafter renewed his license in Florida. The law then in effect in Florida required each licentiate to renew his license annually, paying the required annual renewal fee, prior to January 1, and provided for the automatic cancellation of a license if the licentiate failed to secure a renewal of his license prior to three months after December 31 each year. The law also provided, however, that a license that had been automatically canceled for this reason could be reinstated on application and the payment to the board of $25. Fischwenger's license was canceled in 1928 for his failure to renew it. In 1941 an entirely new dental practice act was enacted in Florida (Laws, 1941, chapter 20240) repealing the previous dental practice acts and requiring in section 17 thereof that every licentiate renew his license annually on or before October 1. The new law provided for the automatic cancellation of a license of any licentiate who had failed to renew his license by December 31. The new act likewise contained a provision authorizing the renewal of the license automatically canceled on the payment to the board by the licentiate of $25. Section 18 of the new act provided also:

> Upon the failure of any dentist to pay the annual renewal fee, provided for in section 17 within two months after September thirtieth, the board shall notify in writing such dentist that such fees have not been paid; a second of such notices shall be sent by the board at the end of the fourth month; at the end of the fifth month after September thirtieth, if such fees remain unpaid, the board shall notify the delinquent by registered mail with return receipt attached that upon failure to apply for renewal certificate and to pay the required fees within the time specified in section 17 the delinquent must submit to an examination.

In 1943 Fischwenger applied to the board of dental examiners to have his license renewed without examination and tendered $25. The board refused to renew the license previously canceled on the ground that, since Fischwenger had forfeited his privilege to practice in Florida by not keeping his license in force from year to year as required by law, he could not be restored to practice except on condition that he submit to a new examination. Fischwenger then brought mandamus against the individual members of the board to compel them to issue a renewal certificate to him to practice dentistry. From an order in favor of the defendant members of the board, Fischwenger appealed to the Supreme Court of Florida, Division B.

Fischwenger contended that one who has once been granted a license to practice dentistry under any dental law in force in Florida at the time of his admission to practice is privileged to renew that license at any time thereafter and without examination on the payment of $25, unless prior to payment he has been served with notice by the board that unless such fees are paid within a certain specified time he will be required to take another examination as a condition to renewal, and the time prescribed by the notice has expired. We think, said the Supreme Court, that Fischwenger has misconceived the effect and intent of the provisions of the 1941 dental practice act referred to. The 1941 act, being an act comprehending the whole subject matter of the prior laws, operated as a repeal of the earlier statutes to the extent that it revised or substituted new provisions therefor. By the terms of section 2 of the new act the privilege of practicing dentistry in the state of Florida was limited, after its passage, to those who were duly licensed and registered dentists under the laws of Florida at the time of the passage of the statute and to those who subsequently became duly licensed and registered as dentists pursuant to its provisions. The language of sections 17 and 18 of the statute has reference only to those persons falling within one or the other of the classes of persons described in section 2 of the 1941 act; it has no application to those persons who fall in any other class. The only persons to whom the board is required to send delinquency notices under section 18 are those who were duly licensed and registered dentists under the laws of Florida at the time of the passage of the statute and who thereafter became delinquent, and those who, having subsequently become duly licensed and registered dentists under the 1941 law, thereafter fail to secure their annual renewal certificates within the time and manner prescribed by the statute. Fischwenger was in neither category. For it is clear that, immediately prior to the time the 1941 act became law, Fischwenger was not entitled to practice dentistry in the state, having forfeited that privilege by his failure to keep his license in force in accordance with the prevailing applicable statutes. At the time the 1941 act became effective his license to practice had long since expired by the limitations fixed by previous statutes in force at the time of its passage, and his right thereafter again to take up his profession in this state was subject to the conditions imposed by the new statute. The practice of dentistry in Florida is not an absolute unqualified or vested right but is a privilege that may be exercised only in subordination to the police power of the state. It may be controlled and regulated by the legislature in the exercise of the police power. When conflicts occur between the right of the citizen to follow such profession and the right of the state to preserve the general health and welfare, the right of the citizen in the matter must yield to the power of the state to prescribe such reasonable restrictions and regulations as may be necessary to protect the people from ignorance, incapacity, deception or fraud. Whatever may have been the conditions prescribed by the law prior to 1941 for continuing in the practice of dentistry, they did not prevent the state, at any time that the public good demanded, from making such further regulations and restrictions as to practice as the legislative authority deemed necessary or proper in the public welfare, so long as such further restrictions and regulations were reasonable and bore some just relation to the matter sought to be regulated. For reasons which were deemed sufficient by the legislature, the 1941 act was passed superseding previous statutes on the same subject and imposing new and more rigid requirements as a condition to continuation in practice. The statute abolished the privilege theretofore granted to delinquent dentists under the prior statutes to reinstate their licenses at any time without taking an examination. It is clearly within the authority granted to the state board of dental examiners by the legislature to require of Fischwenger an examination as a preliminary condition to the issuance of a renewal certificate. The decree in favor of the board of dental examiners was accordingly affirmed.—*Fischwenger v. York, 18 So. (2d) 8 (Fla., 1944).*

Society Proceedings

COMING MEETINGS

Aero Medical Association of the United States, St. Louis, Sept. 4-6. Dr. David S. Brachman, 5440 Cass Ave., Detroit 2, Secretary.

American Congress of Physical Therapy, Cleveland, Sept. 6-9. Dr. Richard Kovacs, 2 East 88th St., New York 28, Secretary.

American Pediatric Society, Atlantic City, N. J., Sept. 25-27. Dr. Hugh McCulloch, 325 N. Euclid Ave., St. Louis 8, Secretary.

American Roentgen Ray Society, Chicago, Sept. 24-29. Dr. H. Dabney Kerr, University Hospitals, Iowa City, Secretary.

Colorado State Medical Society, Denver, Sept. 27-29. Dr. John S. Bouslog, 537 Republic Bldg., Denver 2, Secretary.

Delaware, Medical Society of, Lewes, Sept. 11-12. Dr. W. O. La Motte, 601 Delaware Avenue, Wilmington, Secretary.

Kentucky State Medical Association, Lexington, September 18-20. Dr. P. E. Blackerby, 620 S. Third St., Louisville, Secretary.

Michigan State Medical Society, Grand Rapids, Sept. 27-29. Dr. L. Fernald Foster, 2020 Olds Tower, Lansing 8, Secretary.

Mississippi Valley Medical Society, Peoria, Ill., Sept. 27-28. Dr. Harold Swanberg, 510 Maine St., Quincy, Ill., Secretary.

National Medical Association, St. Louis, Aug. 14-17. Dr. John T. Givens, 1108 Church St., Norfolk, Va., Secretary.

Northern Minnesota Medical Association, Hibbing, Aug. 26. Dr. R. N. Jones, 8 Sixth Ave. N., St. Cloud, Secretary.

Oregon State Medical Society, Portland, Sept. 2-3. Dr. Thomas D. Robertson, St. Vincent's Hospital, Portland, Secretary.

Pennsylvania, Medical Society of the State of, Pittsburgh, Sept. 19-21. Dr. Walter F. Donaldson, 500 Penn Ave., Pittsburgh 22, Secretary.

Radiological Society of North America, Chicago, Sept. 24-29. Dr. Donald S. Childs, 607 Medical Arts Bldg., Syracuse, N. Y., Secretary.

Utah State Medical Association, Salt Lake City, August 24-26. Dr. D. G. Edmunds, 610 McIntyre Bldg., Salt Lake City, Secretary.

Wisconsin, State Medical Society of, Milwaukee, Sept. 18-20. Mr. Charles H. Crownhart, 110 E. Main St., Madison 3, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1934 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Alabama State Medical Assn. Journal, Montgomery

13:333-380 (May) 1944

Unusual Kidney Calcification. J. U. Reaves.—p. 333.
Sterility: Study with Uterotubal Insufflation Apparatus: A Few Male Faults Mentioned. G. F. Douglas.—p. 336.
Early Infant Care. C. K. Pitt.—p. 344.
Health Department and General Practitioner. J. E. Dunn.—p. 346.

American Journal of Hygiene, Baltimore

39:269-432 (May) 1944

*Primary Atypical Pneumonia, Etiology Unknown (Part III). J. H. Dingle, T. J. Abernethy, G. F. Badger, G. J. Buddingh, A. E. Feller, A. D. Langmuir, J. M. Ruegsegger and W. B. Wood Jr.—p. 269.
Jaundice in Army Personnel in Western Region of United States and Its Relation to Vaccination Against Yellow Fever (Part I). W. A. Sawyer, K. F. Meyer, M. D. Eaton, J. H. Bauer, P. Putnam and F. F. Schwentker.—p. 337.

Primary Atypical Pneumonia, Etiology Unknown.—Bacteriologic studies by Dingle and his collaborators at Camp Claiborne failed to reveal the etiology of this disease. In the routine cultures of the throats and sputums of patients with atypical pneumonia no bacterium stood out as a probable etiologic agent by reason of its occurrence or predominance. Evidence has not been obtained that fungi or rickettsias are etiologically associated with atypical pneumonia. The data obtained from anaerobic cultures are probably not sufficiently conclusive to exclude definitely the anaerobic bacteria. The results of the virus studies have provided interesting information regarding the probable distribution of some of the known viruses but have not indicated any one of them as the cause of atypical pneumonia. The data tend to exclude the viruses of influenza and the members of the psittacosis or ornithosis group (psittacosis, meningopneumonitis, lymphogranuloma inguinale). The syndrome was characterized by gradual onset, mild symptoms referable to the upper respiratory tract, distressing cough and moderately severe constitutional reaction. The character of the onset corresponded to that reported by others and differed from that of influenza and the bacterial pneumonias. Although few of the patients appeared as ill as patients with pneumococcic pneumonia, recovery from atypical pneumonia was more protracted. The average period of hospitalization was slightly longer than one month. Atypical pneumonia is one of the most important respiratory infections from the point of view of time lost from training. Atypical pneumonia was first recognized at Camp Claiborne during the course of a moderate epidemic. The disease probably had existed at the camp prior to this outbreak. Subsequent to the epidemic, the diagnosis was made with sufficient frequency to establish atypical pneumonia as one of the endemic respiratory illnesses. The high attack rate among the personnel of the station hospital is in agreement with the findings of other investigators, who observed a high incidence among physicians and nurses. The disease has been considered to be particularly common in adolescent and young adult white males, although the evidence for this cannot be considered conclusive. Almost all reports have emanated from institutions with young adult populations. Better opportunities for recognition of the disease and greater chances for close and repeated contacts in such institutions may explain these findings. In the few reports from general hospitals serving a more diverse population, cases have occurred in all age groups from childhood to advanced age, regardless of sex and race.

American J. Obstetrics and Gynecology, St. Louis

47:593-740 (May) 1944

Observations on Hormonal Content of Ovarian Cysts Associated with Pregnancy. Ruth M. Watts and F. L. Adair.—p. 593.
*Endometriosis and Pregnancy: With Report of 2 Cases. R. B. Scott.—p. 608.
Caudal Analgesia: Experimental and Anatomic Study. Virginia Singleton Lanier, H. E. McKnight and Mildred Trotter.—p. 633.
Treatment of Prothrombinopenia with Water Soluble Menadione. H. R. Litchfield, H. M. Rabinowitz, P. Kavetsky, M. J. Greene and Elsie Kaye.—p. 642.
*Study of Use of Diethylstilbestrol in Inhibition and Suppression of Lactation. J. W. Walsh and W. B. Stromme.—p. 655.
Absorption of Steroid Hormones from Oral Mucous Membranes, with Special Reference to Sublingual Administration of Progesterone. G. W. Corner Jr.—p. 670.
Experience with Supravesical Extraperitoneal Cesarean Section (Waters Operation). I. Daichman and W. Pomerance.—p. 678.
Pain Threshold in Dysmenorrhea. J. O. Haman.—p. 686.
Dimethyl-Ether Stilbestrol in Menopause and for Suppression of Lactation. O. H. Bloom.—p. 692.
Prolongation of Pregnancy and Excessive Fetal Development Following Administration of Corpus Luteum Extract in Treatment of Threatened Abortion. D. P. Murphy.—p. 697.
Spinal Anesthesia to Favor Rapid Dilatation of Cervix in Obstetric Emergencies: Preliminary Report. S. S. Rosenfeld.—p. 699.
Pregnancy at Term in Prolapsed Uterus with Prolapse of Cord. I. Kibel.—p. 703.
Case of Pseudohermaphrodismus Feminus Externus with Uterus Didelphys, Imperforate Anus and Vagina. I. Siegel.—p. 705.
Tubal Pregnancy in Tuberculous Fallopian Tube. B. Mann and D. R. Meranze.—p. 707.
Successful Bronchoscopy for Atelectasis in 6 Hour Old Infant. D. D. Deeds and H. E. Bozer.—p. 711.

Endometriosis and Pregnancy.—Two patients with endometrial cysts complicating pregnancy were recently operated on at Johns Hopkins Hospital. The first patient, a 25 year old primigravida, was known to have an ovarian cyst early in pregnancy. She underwent an exploratory laparotomy at thirty-six weeks because of severe right lower quadrant pain. A ruptured right endometrial cyst and a left endometrial cyst were found. A 2,280 Gm. girl was delivered by cesarean section, and a subtotal hysterectomy, bilateral salpingo-oophorocystectomy, and appendectomy were done. The patient had six years of sterility, but she stated that she did not have dysmenorrhea, abnormal uterine bleeding, lower abdominal pains or other symptoms commonly associated with endometriosis. The probable cause of the rupture of this endometrial cyst was that the cyst was adherent to the uterus and, as the uterus enlarged, the adherent areas of the cyst thinned out until they became separated, allowing the contents of the cyst to escape. The second patient was a 23 year old woman who had a grapefruit sized endometrial cyst of the right ovary removed and a small endometrial cyst resected from the left ovary when ten to twelve weeks pregnant. The patient experienced lower abdominal discomfort for about one month before operation. She subsequently delivered a 2,390 Gm. boy in good condition during the thirty-fifth week of the pregnancy, and the placenta showed a small area of premature separation. The patient had no symptoms of endometriosis prior to the pregnancy. She had been married two years, and no contraception had been practiced. The sterility rate is high in patients with endometriosis, but the collected series of internal and external endometriosis cases complicating pregnancy is evidence enough that such patients can and do become pregnant. This fact should enhance the plea that, when the patient desires preservation of the childbearing function, one should be conservative in the surgical procedure. Internal endometriosis (adenomyoma or adenomyosis) may cause an asymmetry of the uterus indistinguishable from myomatous changes or from a cornual pregnancy and may cause spontaneous rupture in pregnancy or may be the factor for uterine perforation at the time of therapeutic or criminal abortion. Internal endometriosis has caused uterine atony and postpartum hemorrhage. The tumor mass may cause dystocia. There is evidence that this type of endometriosis is an element in spontaneous abortions and miscarriages, ectopic pregnancies and placenta previa. External endometriosis complicating pregnancy is most commonly found in the cul-de-sac of Douglas. Ovarian endometriosis is the second most commonly reported type found during pregnancy. An ovarian cyst may be palpated, but unless there are complaints suggesting endometriosis the

fact that the cyst is endometrial will probably escape notice. The cyst may produce symptoms because of occasional leaking produced by increased countertension by the enlarging uterus on an already tense cyst.

Diethylstilbestrol in Inhibition of Lactation.—Walsh and Stromme report 190 cases in which breast feeding was either not desired by the woman or was contraindicated because of a dead baby, premature baby, flat or inverted nipples, heart disease, previous breast abscess, syphilis, tuberculosis or other conditions. Diethylstilbestrol was highly effective in preventing the development and minimizing the intensity of breast pain. Engorgement was reduced in incidence to one-third that of the controls; it was less intense and developed later in the puerperium. Lactation, while frequently delayed in onset, was definitely though less noticeably depressed than were the other features studied. Erythema was found in but one third the number of diethylstilbestrol treated cases, compared with controls. Fevers associated with breast engorgement occurred in approximately the same number of cases in each group. Entire freedom from breast pain and engorgement in the diethylstilbestrol treated series was striking in contrast with the control series. Conventional therapeutic measures were found to be of little benefit save in the partial reduction of lactation. Separate control studies on the therapeutic effect of diethylstilbestrol, once lactation had been established, showed that the treatment held but slight advantage in the relief of breast pain; that relief from engorgement and subsidence of lactation was definitely though not greatly bettered.

American Journal of Surgery, New York

64:149-296 (May) 1944

*Resuscitation of Heart. R. F. Barber and J. L. Madden.—p. 151.
Osteoplastic Procedure for Correction of Funnel Chest. R. Nissen. —p. 169.
Syphilis and Pregnancy. W. T. Daily.—p. 175.
Epidural Injection Therapy for Sciatic Pain. H. Kelman.—p. 183.
Trauma of Thorax: Collective Review. H. H. Ritter and B. B. Kaye. —p. 191.
Traumatic Rupture of Gastrointestinal Tract by Nonpenetrating Forces. N. F. Hicken and J. H. Carlquist.—p. 209.
Hepatocholecystenterostomy for Relief of Jaundice in Obliteration of Hepatic Ducts. R. F. Carter and B. Marraffino.—p. 217.
*Evaluation of Sulfonamides in Treatment of Peritonitis of Appendical Origin: A Review of 903 Cases of Acute Perforative Appendicitis. C. E. Stafford, J. Beswick and P. H. Deeb.—p. 227.
Kidney Surgery: Review of Cases at Southern Pacific General Hospital from 1930 to 1943. Charles P. Mathé and Manuel J. de Castillo. —p. 235.
Outlook on Carcinoma of Stomach. M. J. Thorstad.—p. 242.
Osteogenic Osteolytic Sarcoma of the Os Pubis. S. T. Friedman.—p. 248.
Operative Position for Ulnar Nerve Transposition. M. Dobelle and S. E. Proctor.—p. 254.
*Occlusion of Infected Patent Ductus Arteriosus with Cellophane. F. R. Harper and M. E. Robinson.—p. 294.

Resuscitation of Heart.—Barber and Madden state that if cardiac massage is performed before irreparable changes have occurred and if artificial respiration is maintained, recovery should occur. The percentage of complete recovery will vary in direct ratio to the time interval between cardiac stoppage and the production of an adequate circulation by massage. The maintenance of a free and adequate artificial respiratory exchange during the course of resuscitation of the heart is essential. Massage of the heart alone is of no avail if proper exchange of gases in the pulmonary alveoli cannot occur. Cases of cardiac stoppage susceptible of complete resuscitation are those resulting from asphyxia, reflex vagal inhibition, cardiac trauma, cardiac toxins (drugs, anesthetics) acute cardiac dilatation, hemorrhage and vasomotor paralysis with resulting circulatory insufficiency, and electrocution. The authors condemn the indiscriminate use of intracardiac injection of epinephrine or other sympathomimetic drugs. These drugs should not be administered during the course of cyclopropane anesthesia. Procaine hydrochloride 2 per cent, administered prior to or simultaneous with the intracardiac injection of epinephrine, lessens the possibility of ventricular fibrillation. Topical application of procaine 5 per cent, metycaine 10 per cent or cocaine 4 per cent may also be used to the surface of the heart; injection of 2 per cent solution into the chambers of the heart and electrical countershock are the most efficient methods in the treatment of ventricular fibrillation. The transthoracic approach is the method of choice in the performance of cardiac massage. Exposure of the heart is obtained through a transverse incision in the left third or fourth interspace, the adjacent costal cartilages sectioned and the corresponding ribs widely retracted. Manual massage of the heart is the most effective means of initiating cardiac contractions. If uniform success is to be obtained, massage must be performed within three minutes after cessation of the heart beat.

Sulfonamides in Peritonitis of Appendical Origin.—Stafford and his collaborators made a survey at the Los Angeles County General Hospital of 903 consecutive cases of acute appendicitis with perforation or abscess formation. During the period from 1939 to 1942 inclusive the mortality rate for perforated appendicitis decreased from 9.2 to 3.4 per cent. Sulfonamides were used with increasing frequency, so that 98 per cent of all cases during 1942 received some form of chemotherapy. The mortality rate decreased each year as the use of sulfonamides increased. Morbidity as well as mortality was reduced, as observed by the yearly decrease in the frequency of postoperative peritoneal abscesses and pneumonitis. Drainage of the peritoneal cavity following appendectomy was used less often, as sulfonamides were used intraperitoneally in nearly all cases. In 1942 1 patient out of 3 had no drain used either in the peritoneal cavity or abdominal wound. In abscess formation following appendical perforation the procedure of choice was incision and drainage only in the completely walled off abscess. In 1942 appendectomy was performed in over three fourths of the abscess cases without fatality. Clinical observations in a large group of cases confirm the experimental evidence that sulfonamides are an effective form of therapy in the treatment of peritonitis. Their use is of particular value when implanted intraperitoneally during the early stages of peritonitis in perforative appendicitis.

Occlusion of Infected Patent Ductus Arteriosus with Cellophane.—As more patients with patent ductus arteriosus are being operated on, it is becoming obvious that the ordinary types of ligature material are inadequate to maintain occlusion of a patent ductus arteriosus. This is particularly true of the infected cases with large irregularly shaped vegetations within the lumen of the ductus arteriosus. Harper and Robinson report a case in which a patent ductus arteriosus was occluded by ligating it with two silk ligatures and then wrapping cellophane loosely about it. The patient was a woman aged 28 in whom a patent ductus arteriosus was complicated by long standing severe subacute bacterial endocarditis and endarteritis. The postoperative course demonstrated that the cellophane was responsible for the final complete occlusion of the patent ductus arteriosus. For the first two weeks the murmur and symptoms disappeared only to reappear and persist until two and one-half months had elapsed from the time of operation. The murmur and symptoms then completely disappeared and the patient has remained entirely well to date, one and one-half years after the ligation.

American Review of Tuberculosis, New York

49:395-484 (May) 1944

*Sulfonamide Therapy in Actinomycosis: 2 Cases Caused by Aerobic Partially Acid Fast Actinomyces. E. P. Benbow Jr., D. T. Smith and K. S. Grimson.—p. 395.
*Atypical Pneumonia Simulating Pulmonary Tuberculosis. J. S. Yoskalka. —p. 408.
"Speed of Reaction" Hypothesis: Its Numerical Foundations in Respect to Tubercle Bacillus. H. W. Hill.—p. 414.
Influence of Environmental Factors on Fever in Pulmonary Tuberculosis. J. S. Howe and A. Mayne.—p. 423.
Basal Pulmonary Tuberculosis: Results of Treatment. B. L. Gordon, R. Charr and M. J. Sokoloff.—p. 432.
Boeck's Sarcoid and Systemic Sarcoidosis: (Besnier-Boeck-Schaumann Disease) A Study of 35 Cases. D. Reisner.—p. 437.
Growth of Human Tubercle Bacilli Under Restricted Air Conditions. M. L. Cohn.—p. 463.

Sulfonamide Therapy of Actinomycosis.—Benbow and his associates state that approximately 90 per cent of the clinical cases of actinomycosis are caused by Actinomyces bovis. Reports indicate that sulfonamides are effective in the treatment of this disease. In most instances the sulfonamides were given in conjunction with potassium iodide. Ten per cent of cases of clinical actinomycosis are caused by aerobic Actinomycetes or Nocardia. Some of these Nocardia are acid fast or partially

acid fast. Twenty-six cases of pulmonary infection with the acid fast type have been collected from the literature. The mortality is high: 25 of the 26 patients were dead at the time the reports were published. The authors report 2 new cases of pulmonary and chest wall infections with acid fast Nocardia. The first patient developed weakness and loss of weight. The x-ray film showed an infection of the left lung. Three draining sinuses appeared in the neck, chest and hip. Acid fast actinomyces was found in the sputum and in drainage from the sinuses. After seven months' treatment with bed rest, vitamins, sulfonamides, x-ray therapy, surgical drainage and potassium iodide the patient made slow but steady improvement; she is now apparently well. The second patient developed an abscess in the subcutaneous tissues of the chest wall, followed by the appearance of multiple abscesses of the lung and a perirectal abscess. Acid fast actinomyces was found in the sputum and in the perirectal abscess. With surgical drainage of the chest wall abscess, surgical and x-ray therapy for the perirectal abscess, supplemented by sulfadiazine and potassium iodide, the patient improved steadily. In actinomycosis sulfonamides do not give results analogous to those observed in pneumococcic pneumonia or meningococcic meningitis. Although temporary improvement nearly always follows their use, the authors have seen several cases of the anaerobic type in which the disease again became progressive and resulted in death. Actinomycosis is a chronic disease with remissions, spreads and generalized dissemination analogous to tuberculosis. Patients should be observed for a period of years rather than months before being classified as cured.

Atypical Pneumonia Simulating Pulmonary Tuberculosis.—Atypical pneumonia can produce lesions which at times are indistinguishable from pulmonary tuberculosis. Yoskalka observed 7 patients with upper lobe involvement among 96 patients with atypical pneumonia. Two of these had been roentgenologically diagnosed as having pulmonary tuberculosis. Conversely, 1 case had been diagnosed as atypical pneumonia which later proved to be tuberculosis. Approximately 7 to 10 per cent of atypical pneumonias have upper lobe involvement, the usual site for pulmonary tuberculosis. Serial roentgenograms showing apical lesions failing to clear in twenty days following the onset of the disease should raise the suspicion of pulmonary tuberculosis. Sputum studies for tubercle bacilli are indicated in all doubtful cases. If lesions persist for twenty days from the onset of the illness and routine sputum studies are negative, further studies should be done, such as sputum and gastric concentrates and guinea pig inoculation. Because of the apparent increase in the incidence of atypical pneumonia, the need for an early differential diagnosis is imperative.

Annals of Internal Medicine, Lancaster, Pa.

20:733-880 (May) 1944

American Medicine in War and Peace. E. E. Irons.—p. 738.
Salmonella Infections: Report of 37 Cases Observed at Beth Israel Hospital, New York in Past Four Years. E. Seligmann and J. J. Hertz.—p. 743.
*Histaminic Cephalalgia and Migraine. L. E. Lieder.—p. 752.
Psychosomatic Medicine: Some Notes on Its Application in Diagnosis and Treatment of Disease. M. Lipkin and L. I. Sharp.—p. 760.
Recent Advances in U. S. Public Health Service Methods. F. V. Meriwether.—p. 768.
Inversion of T Waves of Electrocardiogram in Two Patients with Neurocirculatory Asthenia. W. Merritt.—p. 773.
Primary Carcinoma of Jejunum and Ileum. P. G. Boman.—p. 779.
Postgastrectomy Gastritis. D. C. Browne and G. McHardy.—p. 789.
Treatment of Attacks of Sinus Tachycardia with Prostigmine. S. Waldman and S. N. Moskowitz.—p. 793.
Summary of 80 Living Cases of Pernicious Anemia. M. Hardgrove, R. Yunck, H. Zotter and F. Murphy.—p. 806.

Histaminic Cephalalgia and Migraine.—Lieder studied 71 consecutive patients with headache. Careful classification showed that 4 of these patients had histamine cephalalgia, 52 had typical migraine and 15 had miscellaneous causes for their headache, such as hypertension and anxiety states. Histaminic cephalalgia is a vascular headache which is amenable to treatment with histamine. Its clinical characteristics are (1) absence of familial history of "sick" headache or allergic diseases, (2) onset most common in fourth or fifth decades, (3) short duration, (4) hemicrania usually, severe pain, constant, excruciating, burning, boring, (5) usually occurring during the night, (6) eased by sitting up or standing erect, (7) associated with vasomotor phenomena consisting of lacrimation, congestion of the eye on the involved side, rhinorrhea or stuffiness of the nostril, increased surface temperature and often swelling of the temporal vessels of the involved side of the head, (8) attacks frequent, (9) compression of the common carotid and sometimes of the temporal artery frequently giving prompt relief, (10) occasional nausea, no vomiting, (11) no aura, (12) no relationship to the menstrual period, (13) alcoholic beverages frequently precipitating attacks, (14) histamine 0.1 to 1.2 mg. subcutaneously usually giving a typical attack of unilateral pain identical with the spontaneous attack, (15) epinephrine 1:400,000 solution, intravenously, giving prompt relief, (16) cure by hyposensitization to histamine. The efficacy of histamine hyposensitization therapy in histamine cephalalgia was confirmed in 2 patients. In 28 of the 52 patients with migraine, food allergy was found. Twenty-three of these patients exhibited other major allergic diseases such as hay fever, urticaria and asthma. A positive family history of allergy or migraine was obtained in 40 patients. Hypersensitivity assumes a major role in causing migraine. In the prophylaxis of migraine, identification and elimination of offending allergens, usually foods, is important. Physical and mental strain, which are predisposing factors, should be avoided. Ergotamine tartrate 0.25 to 0.50 mg. given subcutaneously is by far the best and simplest therapeutic agent.

Archives of Dermatology and Syphilology, Chicago

49:305-388 (May) 1944

Effectiveness in Vitro of Sulfonamide Compounds on Sporotrichum Schencki: Report of 5 Cases of Sporotrichosis in North Carolina. R. O. Noojin, and J. L. Callaway, with technical assistance of Judith Killian.—p. 305.
Dermal Myiasis: Report of Three Cases. J. W. Young.—p. 309.
*The Asbestos Corn. H. S. Alden and W. M. Howell.—p. 312.
Mycosis Fungoides with Bullous Lesions: Special Tests and Laboratory Data Indicating Adrenal Insufficiency. J. Garb.—p. 315.
Concentration of Arsenic in Blood After Administration of Mapharsen by Rapid Drip Method: Clinical and Experimental Studies. O. M. Gruhzit, J. A. Sultzaberger and L. W. Shaffer.—p. 321.
Serum Protein in Dermatoses. W. Mulvehill.—p. 327.
Contact Dermatitis Due to Capeweed. E. A. Hand.—p. 331.
Epidermolysis Bullosa. S. I. Greenberg.—p. 333.
Asymmetric Cutaneous Lesions in Pellagra. W. Bennett Bean, T. D. Spies and R. W. Vilter.—p. 335.
Area Factor in Roentgen Irradiation. H. C. Goldberg.—p. 346.
Treatment of Erysipeloid by Cryotherapy. C. M. Griswold and Shirley S. Bowen.—p. 348.
Papulonecrotic Tuberculid in the Negro: Its Clinical Resemblance to Acne Vulgaris and Early Syphilis. S. Irgang.—p. 351.

Asbestos Corns.—Derwitz in 1930 directed attention to warts and corns on the hands and feet of persons who worked with asbestos and described the discovery of an "asbestos needle" in the cornified layer of tubercles removed from the hands. Alden and Howell observed small painful "warts" or "corns" in 99 of 167 workers who used amosite, a natural form of asbestos, in their work in a navy yard. The workers who have these lesions complain of an original pricking sensation and ability to feel a small splinter-like foreign body. Rough attempts to extract this splinter-like body are usually unsuccessful, but with rubbing or with neglect the sensation tends to disappear. In about ten days a small hard cornlike tumor appears, which slowly grows, often attaining the size of a small split pea. Frequently a pinpoint black center, which defies extraction, can be observed in the excrescence. At this period the small cornified tumor is tender to pressure, as though a splinter were present, and interferes with comfortable work. Cornification becomes more pronounced, a small hard corn resulting, and the area does not become normal in appearance and feeling until the hard center plug is removed by instrumentation. These corns usually appear on the tips of the fingers and knuckles, most often occurring in the thick skinned areas of the hands. X-ray examination does not reveal abnormal shadows. Biopsy specimens from 4 patients revealed no pathologic changes except extreme thickening of the surface epithelium with hyperkeratosis. The dermis, while fibrous, was essentially normal in appearance and did not present any evidence of inflammation. Despite diligent search, foreign bodies could not be found in the sections. Observations and history of symptoms imply, however, that a foreign body is at some time present in the lesions. There is no relation to abestosis of the lungs. No satisfactory method of prevention can be offered.

Archives of Otolaryngology, Chicago

39:359-464 (May) 1944

The Eustachian Tube: Review of Its Descriptive, Microscopic, Topographic and Clinical Anatomy. G. O. Graves and L. F. Edwards.—p. 359.
Bacillus Proteus Infections: Review of Literature and Report of Case of Septicemia of Otitic Origin Treated with Sulfapyridine, with Recovery. T. L. McKee.—p. 398.
Congenital Laryngeal Stridor (Inspiratory Laryngeal Collapse): New Theory as to Its Underlying Cause and Desirability of Change in Terminology. L. Schwartz.—p. 403.
*Blast Injury of Ears. L. E. Silcox and H. P. Schenk.—p. 413.
Pathology of Petrositis: Report of 3 Cases. A. A. Eggston.—p. 421.
Chronic Progressive Deafness, Including Otosclerosis and Diseases of Inner Ear. G. E. Shambaugh Jr., Elizabeth A. Leggett and F. J. Wojniak.—p. 434.

Blast Injury of Ears.—Silcox and Schenck say that, of 1,922 casualties classified as having traumatic or surgical injuries and admitted to a hospital ship during the Solomon Islands campaign, 82, or 4.2 per cent, had blast injury of the ears serious enough to warrant observation and treatment by the otolaryngologist. Many patients had varying degrees of aural damage from concussion waves, but blast injuries of a more serious character to the thoracic or the abdominal viscera of these patients precluded extensive aural study. They were not included in this series. The commonest type of aural lesion was traumatic rupture of the tympanic membrane with or without secondary infection. Other forms of aural damage included traumatic deafness, which was almost universally present in varying degree, hemorrhage into the middle ear cavity, dislocation of the ossicles and labyrinthine hemorrhage. The precipitating causes for aural damage were (*a*) atmospheric blast arising from the detonation of aerial bombs, large caliber shells, mortar shells, hand grenades and land mines and (*b*) immersion blast from detonation of depth charges when the subject was in the water. Forty-one of the 82 patients gave a history of exposure to blast waves from bombs, and of this group 11 were unconscious following the concussion. Fifty-eight patients had perforation of the tympanic membrane. Suppurative otitis media was present at the time of admission in 35 of the 82 patients. As infection developed in such a high proportion of the patients without the technical error of syringing, it might be prudent to suggest the prophylactic measure of applying locally microcrystals of sulfathiazole as soon as possible after traumatic rupture has occurred. When secondary infection does not supervene, a traumatic perforation of the drum membrane heals promptly. Occasionally both the hearing and the tinnitus can be improved by inflation of the eustachian tube, particularly when the tympanic membrane is intact. Deep diathermy, concentrated vitamin B and rest are adjuvants, If there is superimposed suppurative otitis media, the insufflation of microcrystalline sulfathiazole powder or the instillation of a suspension of this drug into the external auditory canal will promptly control the infection.

Archives of Physical Therapy, Chicago

25:263-314 (May) 1944

Influence of Short Wave Current on Intraspinal Temperature. W. Bierman and S. Feitelberg.—p. 263.
Physical Therapy in Veterans Administration. C. M. Griffith.—p. 265.
Observations on Rehabilitation of War Wounded in Navy Physical Medicine Department. J. L. Rudd.—p. 268.
*New Approach to Problem of Incipient and Recurrent Malaria: Preliminary Report. G. E. Drewyer and J. E. Hughes.—p. 273.
Program for Rehabilitation of Injured. C. O. Molander.—p. 276.
Center of Gravity of Human Body, with Discussion of Equipment of German Infantryman. Susanne Hirt, E. Corrinne Fries and F. A. Hellebrandt.—p. 280.
Electrodiagnostic Interpretations in Nerve Lesions. P. Bauwens.—p. 288.

New Approach to Recurrent Malaria.—The tendency of malaria to recur after seemingly adequate therapy led Drewyer and Hughes to investigate what could be accomplished in preventing recurrence of symptoms. At the United States Naval Convalescent Hospital at Glenwood Springs, Colo., there is a natural hot vapor cave which is heated by a hot mineral water spring. The temperature of the spring is 140 F. The temperature in the cave varies between 102 and 110 F., with a relative humidity of 87 to 93 per cent. Patients are treated in the cave for a total of twenty minutes in divided periods, ten minutes at first with a three minute rest, then seven minutes with a three minute rest and finally three minutes. The average oral temperature rise is 2 to 3.4 degrees. The patients are then brought upstairs and placed on a plinth; they are wrapped in a sheet and wool blanket and allowed to cool gradually for half an hour. Patients are treated daily. In latent malaria, when the plasmodium remains in the stagnant capillary beds of the spleen, liver and other organs, the artificial raising of the systemic temperature causes a general capillary dilatation with discharge into the peripheral circulation of red blood corpuscles with the dormant plasmodium, which within a period of twenty-four to ninety-six hours results in a typical malarial paroxysm. After a positive blood smear for the plasmodium is obtained, therapy is instituted in the form of quinine sulfate, 36 grains (2.4 Gm.) in three divided doses daily. Drug therapy is continued until the patient is afebrile for five days and the blood smear is negative for malaria. The patient is then returned to the department of physical medicine for five more fever sessions in the hot vapor caverns. During this time he continues to take quinine at the same dosage. The quinine is then stopped and the fever sessions are continued for six days. Whereas with ordinary treatment 8 of 26 patients had a recurrence, following the combination of artificial pyrexia and drug therapy there has been no recurrence of symptoms.

Arkansas Medical Society Journal, Fort Smith

40:213-232 (May) 1944

Medical Education in the Future. V. Johnson.—p. 213.

41:1-42 (June) 1944

President's Address. S. J. Allbright.—p. 1.

Bull. of the U. S. Army Med. Dept., Washington, D. C.

77:1-122 (June) 1944

Fumigation of Army Buildings. W. D. Read.—p. 77.
Coronary Occlusion in Race Horse. R. T. Gilyard.—p. 87.
Injuries Incurred on Obstacle Courses. D. Sloane.—p. 89.
Trench Foot. R. C. Berson and R. J. Angelucci.—p. 91.
Division Dental Clinic in the Field. J. P. Williams.—p. 100.
*Treatment of Undisplaced Fractures at Ankle Joint. M. Cleveland, L. J. Willien and P. C. Doran.—p. 103.
Classification of Shigellas. N. W. Larkum.—p. 106.
Herniation of Muscles of Lower Leg. L. N. Cozen.—p. 111.
Lessons Learned from Pension Rating Boards. F. J. Vokoun.—p. 113.

Undisplaced Fractures at Ankle Joint.—Cleveland and his associates point out that rigid immobilization for fracture at the ankle joint, whether accompanied by displacement or not, was the rule. The most frequent bony injury about the ankle joint involved the distal one fourth of the fibula at the external malleolus or slightly above it in the fibular shaft. The convalescent—out of plaster—phase was frequently longer than the time of immobilization. This period was characterized by persistent dependent swelling, pain on weight bearing with crutches, and limitation of motion. Many of these patients had the partial use of their extremity throughout the immobilized period by attached or incorporated walking devices. For this type of injury a revision of treatment was instituted. Immobilization was discarded in favor of bed rest, elevation, ice packs and early active mobility. Weight bearing with crutches was permitted on subsidence of the soft tissue damage. All such treated cases needed no manipulation. The security of the ankle joint mortise was proved by x-ray studies. The impression was that the group of nonimmobilized patients recovered more rapidly than did the immobilized ones. The records of 32 external malleolar fractures without any or with minimal displacement which were treated with a circular plaster of paris dressing were contrasted with a similar number which received the bed rest and nonimmobilization routine. The average period of hospitalization and duty days lost by the immobilized patients was 57.3 days. For the nonimmobilized patients the duration of hospital stay was 35.7 days.

California and Western Medicine, San Francisco

60:129-232 (April) 1944

Future of Medicine from Standpoint of Physician in Practice. M. R. Gibbons.—p. 197.
Tuberculosis in Wartime. C. R. Howson.—p. 199.
Extreme Insulin Resistance in Diabetes. H. C. Shepardson, G. Goble and Polly B. Withrow.—p. 201.
Clinical Diagnosis of Cerebellar Injuries. W. T. Grant.—p. 204.
California Physicians' Service. G. E. Outland.—p. 209.

Canadian Medical Association Journal, Montreal

50:403-504 (May) 1944

Procedures Recommended for Organization and Operation of Blood Bank. L. J. Rhea, O. F. Denstedt, A. Bertrand, C. J. E. van Dorsser and P. H. Greey.—p. 403.
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Study of Shock Produced by Intraperitoneal Implantation of Muscle. J. L. A. Fowler.—p. 416.
Metrazol Shock Therapy Administered in General Hospital. J. A. Cummins.—p. 420.
The Older Worker. Lydia G. Giberson.—p. 422.
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Fetal Endocarditis (Report of Case). R. R. MacGregor and R. McKendry.—p. 433.
Method of Fixation in Fractures Involving Maxillary Antrum. E. E. Scharfe.—p. 435.
Rare Ovarian Tumor (Brenner Type or Adenoacanthoma?). J. C. Simpson and A. Branch.—p. 437.
Leiomyoma of Urethra (Female). M. Ratner and A. Strasberg.—p. 439.
Toxic Effects of Sulfonamide Therapy on Urinary Tract. D. Swartz. —p. 440.
Pentothal Sodium Anesthesia. I. Rachmel.—p. 443.

Experimental Medicine and Surgery, Brooklyn

2:93-192 (May) 1944. **Partial Index**

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Hyperprothrombinemia, a Premonitory Sign of Thromboembolization: Description of Method. S. Shapiro.—p. 103.
Electrocardiographic Studies in Newborn. F. M. Groedel and M. Miller. —p. 110.
Further Observations on Effect of Subcutaneous Injection of Amino Acids and Creatine on Appearance, Growth and Regression of Emge Sarcoma in Rats. H. H. Beard and E. Givens.—p. 125.
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Florida Medical Association Journal, Jacksonville

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30:501-568 (June) 1944

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Gastroenterology, Baltimore

2:233-306 (April) 1944

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Hypertrophic Pyloric Stenosis in Adults. H. Wakefield.—p. 250.
Frequency of Bacillary Dysentery at Cook County Hospital, Chicago, Ill. F. F. Chesley and C. I. Woolsey.—p. 258.
Gastrointestinal Hypochondriac and Some Lessons He Taught. W. C. Alvarez.—p. 265.
Effect in Vitro of Various Detergents on Peptic Activity of Human Gastric Content. J. B. Kirsner and R. A. Wolff.—p. 270.
*Experimental Production of Acute and Subacute Gastric Ulcers in Cats by Intramuscular Injection of Caffeine in Beeswax. J. A. Roth and A. C. Ivy.—p. 274.

Gastric Ulcers Produced by Injection of Caffeine.—Roth and Ivy employed the technic of embedding caffeine in a beeswax-liquid petrolatum mixture in order to obtain prolonged and continuous caffeine action. The mixture was prepared in batches of 22.5 Gm. of anhydrous caffeine alkaloid, 15 cc. of melted bleached beeswax and 60 cc. of hot liquid petrolatum. The mixture was injected alternately into the shoulder, thigh, calf and back muscles of 22 cats, which weighed from 3½ to 7 9/10 pounds (1,588 to 3,518 Gm.) and were given 300 mg. of caffeine base daily. Eleven of the 22 cats developed bleeding erosions or ulcers. All of the mucosal defects appeared in the lesser curvature of the stomach, in the antral and prepyloric regions. The stomachs contained black-brown stained material and showed numerous punctate bleeding points surrounding the ulcers. Grossly the mucosal defects resembled those occurring spontaneously in man. The acute and subacute bleeding erosions and ulcers observed in the gross specimens were confirmed and studied in detail in microscopic sections. The microscopic picture suggests that the vasodilatation and engorgement might in turn give rise to stasis, increased capillary permeability, transudation and impaired cell nutrition, all of which would contribute to the development of ulceration. The experiments imply that the excessive use of beverages containing caffeine might assume a contributory role in the pathogenesis of gastroduodenal ulcers in man. In view of these findings and the pronounced stimulation of gastric secretion in man by the oral or parenteral administration of caffeine, it is suggested that the use of caffeine beverages be restricted in the management of the peptic ulcer patient.

Georgia Medical Association Journal, Atlanta

33:129-168 (May) 1944

Medical Problems of Today. W. A. Selman.—p. 129.
Management of Hyperthyroidism. P. E. Roberson.—p. 133.
Fracture of Femoral Neck and Trochanter. L. Thornton.—p. 136.
Treatment of Deep Burns and Contractures. J. H. Kite.—p. 139.
The Man in Medicine. M. S. Pittman.—p. 144.
Stephens Hales and Founding of Georgia. J. Krafka Jr.—p. 149.
Ethyl Chloride Spray for Freezing Donor Area in Skin Grafting. J. H. Gaston.—p. 151.

Illinois Medical Journal, Chicago

85:213-268 (May) 1944

Value of Surgery and X-Ray Treatments in Carcinoma of Breast. R. T. Pettit.—p. 244.
Medical Education and War. J. R. Miller.—p. 247.
Medical Education in the Present War. E. J. Carey.—p. 252.
Inversion of Uterus. C. W. Barrett.—p. 253.

Journal of Clin. Endocrinology, Springfield, Ill.

4:147-178 (April) 1944

Hexestrol: Clinical Study over Period of Twenty-Seven Months. J. S. Ersner, B. Mann and B. Zamostien.—p. 147.
Excretion of Neutral 17-Ketosteroids in Adrenal Cortical Tumor and Feminine Pseudohermaphroditism with Adrenal Cortical Hyperplasia. W. W. Engstrom, H. L. Mason and E. J. Kepler.—p. 152.
Sublingual Absorption of Progesterone and Anhydrohydroxyprogesterone: I. Endometrial Studies. R. B. Greenblatt.—p. 156.
Uterothermometry: Study of Uterine Temperature During Reproductive Life, Menopause and Amenorrhea. E. M. Klaften.—p. 159.
Evaluation of Sex Hormones in Treatment of Benign Prostatic Hypertrophy, Carcinoma of Prostate and Other Diseases of Genitourinary System. N. J. Heckel.—p. 166.
Problems Involved in Diagnosis and Management of Male Infertility. N. J. Heckel.—p. 173.

Journal Industrial Hygiene & Toxicology, Baltimore

26:133-208 (May) 1944

Physiologic Principles Governing Action of Acetone Together with Determination of Toxicity. H. W. Hagard, L. A. Greenberg and J. McC. Turner.—p. 133.
Nitrogen Requirement of Patients with Thermal Burns. F. H. L. Taylor. —p. 152.
Some General Principles Underlying Primary Local Treatment of Burns: Review. S. M. Levenson.—p. 156.
Possible Toxicity of Lead Alloys: IV. Studies of Possible Toxicity of Two-Tin-Low and One-Tin-Free Substitute Solders. K. Salomon and G. R. Cowgill.—p. 162.
Flicker Fusion Frequency as Test of Fatigue. J. Brozek and A. Keys. —p. 169.
Chemistry of Wetting Agents. G. E. Morris.—p. 175.

Journal of Nutrition, Philadelphia

27:355-434 (May) 1944

Unidentified Factor(s) in Yeast and Liver Essential to Cure of Achromotrichia in Dogs on Synthetic Diets. D. V. Frost and F. Peirce Dann.—p. 355.
*Retention of B Vitamins in Rare and Well Done Beef. Sylvia Cover, Barbara A. McLaren and P. B. Pearson.—p. 363.
Comparison of Response of Turkey Poults and of Chicks to Different Forms of Vitamin D. H. R. Bird.—p. 377.
Simplified Diets for Guinea Pig. K. A. Kuiken, R. H. McCoy, M. O. Schultze and C. G. King.—p. 385.
Studies on Absorption of Carotene. R. J. Shaw and H. J. Deuel Jr. —p. 395.
Efficacy of Vitamin D from Different Sources for Turkeys. R. V. Boucher.—p. 403.
Pyridoxine Content of Fresh, Pasteurized, Evaporated and Dried Milk. A. Z. Hodson.—p. 415.
Retention of Vitamins in Pork Hams During Curing. B. S. Schweigert, J. M. McIntire and C. A. Elvehjem.—p. 419.
Studies of Pantothenic Acid Deficiency in Dogs. R. H. Silber.—p. 425.

B Vitamins in Beef.—Cover and her associates point out that the vitamin content of meat usually has been reported on the raw basis. Heat losses during cooking may be expected. Rare roast beef is cooked to a lower internal temperature than

well done beef and has lower weight losses in the oven. Since these factors may affect the retention of the B vitamins, it seemed desirable to determine the losses of thiamine, riboflavin, nicotinic acid and pantothenic acid in rare and well done beef, roasted by a method which not only is suitable for use in the home but could be controlled carefully enough for research purposes. Right and left two-rib roasts of beef were cut alike and used as pairs, one being analyzed raw and the other after cooking by a standardized method. The entire meat in each roast was ground and samples were used for the determination of thiamine, riboflavin, nicotinic acid and pantothenic acid. The average vitamin content of eighteen raw roasts from the commercial carcasses was, in microgram/Gm., thiamine 1.3, riboflavin 1.5 and 1.6 by the fluorometric and microbiologic methods respectively, nicotinic acid 49 and pantothenic acid 4.9. Differences in vitamin content between the raw rib roasts within a carcass were not significant for any of the four vitamins, but differences between animals were highly significant. Retentions in rib roasts of beef, rare and well done respectively, were thiamine 75 and 69 per cent, riboflavin 83 and 77 per cent, nicotinic acid 75 and 79 per cent, pantothenic acid 91 and 75 per cent. Retentions of thiamine and pantothenic acid were significantly lower in the well done than in the rare roast, but with riboflavin and nicotinic acid the differences between rare and well done roasts were not significant. One serving of rib roast of beef was calculated to furnish approximately 7 per cent of the thiamine, 6 per cent of the riboflavin and 37 per cent of the nicotinic acid recommended for a moderately active woman for one day.

Journal Pharmacology & Exper. Therap., Baltimore

80:309-416 (April) 1944

Pharmacologic Action of Venom of Latrodectus Mactans and Other Latrodectus Spiders. R. R. L. Sampayo.—p. 309.
Effect of Temperature on Inactivation of Epinephrine in Vivo and in Vitro. F. A. Fuhrman, J. M. Crismon, Geraldine J. Fuhrman and J. Field II.—p. 323.
Spasmolytic and Local Anesthetic Action of Some Esters of 9, 10-Dihydroanthracene-Carboxylic Acid and Related Compounds. G. Lehmann and P. K. Knoefel.—p. 335.
Studies on Relation of Drug Addiction to Autonomic Nervous System: Results of Tests of Peripheral Blood Flow. C. K. Himmelsbach.—p. 343.
*Action of Atabrine on Electro Cortico Potentials. E. P. Pick and J. Hunter.—p. 354.
Influence of Thiamine Deficiency on Work Performance in Rats. M. Kniazuk and H. Molitor, with technical assistance of J. Hunter, H. Kasha and W. O'Shanny.—p. 362.
Biologic Assay of Posterior Pituitary. R. E. Thompson.—p. 373.
Studies on Antimalarial Drugs: Excretion of Atabrine in Urine of Human Subject. F. E. Kelsey, F. K. Oldham, E. H. Dearborn, M. Silverman and E. W. Lewis.—p. 383.
Studies Concerning Absorption and Detoxification of Anesthetic Steroids. H. Selye and Helen Stone.—p. 386.
Studies on Antimalarial Drugs: Preparation and Properties of Metabolic Derivative of Quinine. F. E. Kelsey, E. M. K. Geiling, Frances K. Oldham and E. H. Dearborn.—p. 391.
Studies on Detoxication of Organic Arsenical Compounds: V. Additional Detoxicants for Pentavalent Arsenicals. J. H. Sandground.—p. 393.
Inhibition of Histamine Effects by Compounds of Histamine, Histidine and Arginine. M. R. E. Silva.—p. 399.

Action of Atabrine on Electro Cortico Potentials.—Pick and Hunter studied the reaction of the brain cortex to varying doses of atabrine. They made their investigations on cats and frogs. They found that atabrine in doses of 5, 10 and 12 mg. per kilogram given intraperitoneally or intravenously can alter the electrocorticogram of cats in pentobarbital sodium anesthesia. The rapid wave frequency usually disappeared, and only slow waves of low amplitude remained. This central depressant action of atabrine seems to be independent of the atabrine blood concentration and appears to be related to the atabrine content of the brain. This effect persisted, depending on the dose given, for one to four hours. A similar atabrine action was seen in the electrocorticogram of pithed frogs following the injection of atabrine. The authors conclude that their results tend to support clinical observations of central disturbances occurring during or following the administration of atabrine.

Nebraska State Medical Journal, Lincoln

29:133-164 (May) 1944

Treatment of Concomitant Strabismus. S. R. Gifford.—p. 136.
Effect of Stilbestrol on Puerperal Breast Engorgement: Preliminary Report. W. E. Brown and L. G. Grant.—p. 140.
Traumatic Rupture of Kidney. P. Adams.—p. 142.
Deep Lipoma: Case Report. W. G. Kraybill.—p. 146.
Imported Nematodes. L. O. Vose.—p. 148.

New England Journal of Medicine, Boston

230:567-594 (May 11) 1944

*Meningoencephalitis in Lymphogranuloma Venereum: Report of 2 Cases. C. J. D. Zarafonetis.—p. 567.
Carcinoma of Thyroid Gland with Solitary Metastasis to Skull: Report of Case. H. L. Albright.—p. 573.
Gynecology: Carcinoma of Cervix. J. V. Meigs.—p. 577.

Meningoencephalitis in Lymphogranuloma Venereum.—Zarafonetis presents evidence that lymphogranuloma venereum may be a cause of acute meningoencephalitis. He reports 2 cases. A virus was isolated from an inguinal lymph node of 1 patient five months after the onset of illness, in spite of the fact that the histopathologic changes in the lymph node were nonspecific. The virus was identified as lymphogranuloma venereum. Mice were immunized to this virus and to another strain of lymphogranuloma venereum by intraperitoneal injection. Subarachnoid block, an extremely high total protein and first zone colloidal gold curves were observed. Positive Frei tests were obtained on 1 patient with an antigen made from the virus isolated from him as well as with other yolk sac antigens. An intradermal test on the same patient with psittacosis antigen was negative. The etiologic relationship of the virus to the meningoencephalitic changes was based on the involvement of the central nervous system, the knowledge that this virus can produce meningoencephalitic signs in experimental animals, the fact that the virus has been isolated from the spinal fluid of other patients with the disease and the negative serologic results in tests against other encephalitis-producing virus agents. Final proof that lymphogranuloma venereum can cause meningoencephalitis in man must await isolation of the virus from the brain substance in a fatal case and the demonstration of microscopic changes in the brain tissue consistent with those produced by the virus in experimental animals. On the basis of the spinal fluid dynamics, the first patient presented a complete spinal block throughout the eight months he was observed. It is believed that the meningeal involvement early in the course of his illness resulted in subarachnoid block. This syndrome is known to occur in patients with acute purulent meningitis, tuberculous meningitis, yeast meningitis and syphilitic meningitis. Since these causes were excluded by cultural and serologic studies, it appears probable that the adhesive arachnoiditis was a residuum of the lymphogranuloma venereum infection.

New Jersey Medical Society Journal, Trenton

41:179-220 (May) 1944

Importance of Proctologic Examinations, with Brief Remarks on Pathogenesis of Anorectal Disease. J. Gerendasy.—p. 183.
Primary Atypical Pneumonia, Etiology Unknown: Clinical Study of 96 Cases. J. S. Yoskalka.—p. 188.
Public's Stake in Non-Government Health Insurance. E. A. van Steenwyk.—p. 194.
It's a Matter of Team Work. J. L. Neff.—p. 200.

New Orleans Medical and Surgical Journal

96:489-550 (May) 1944

New Orleans Medical and Surgical Journal, One Hundred Years of Medical Journalism in Louisiana, May 1844-May 1944. Dr. Matas.—p. 489.
Early History of New Orleans Medical and Surgical Journal. A. E. Fossier.—p. 496.
Medical Literature in Louisiana Prior to Advent of New Orleans Medical and Surgical Journal. W. D. Postell.—p. 508.
Biographic Annotations Appended to Pictorial Gallery of Editors and Builders of New Orleans Medical and Surgical Journal Since Its Birth in May 1844 to Close of First Centenary of Its Service to Medical Profession, Under Auspices and Ownership of Louisiana State Medical Society on May 4, 1944. R. Matas.—p. 519.
New Orleans Medical and Surgical Journal: Bibliographic Notes. Mary Louis Marshall.—p. 523.
Comments by Daniel Drake on Medicine in New Orleans in 1844. J. H. Musser.—p. 528.
Louisiana: Its Record of Medical Progress, 1718-1860. W. D. Postell.—p. 530.

Psychosomatic Medicine, Baltimore

6:119-188 (April) 1944

Some Special Aspects of Psychotherapy in Army Air Forces. J. M. Murray.—p. 119.
Brief Psychotherapy in War Neuroses. R. R. Grinker and J. P. Spiegel. —p. 123.
Combined Amphetamine Sulfate (Benzedrine Sulfate) and Belladonna Alkaloid Therapy of Regression Neuroses: Report of This Medication with Clinical and Normal Subjects. J. S. L. Jacobs.—p. 132.
Effect of Mental Activity on Incidence of Seizures and Electroencephalographic Pattern in Some Epileptics, with Remarks on Influence of Amphetamine Sulfate. H. Strauss.—p. 141.
Abstract and Categorical Behavior Following Therapeutic Brain Surgery. G. W. Kisker.—p. 146.

United States Naval Med. Bulletin, Washington, D. C.

42:1009-1232 (May) 1944. **Partial Index**

Combat Injuries in South Pacific. L. S. Auster.—p. 1009.
Early Care of Facial Wounds. S. A. Myers.—p. 1019.
Perforating Wounds of Chest. M. C. Overton Jr. and R. J. Criss Jr. —p. 1021.
Postoperative Urinary Retention: Clinical Study of 1,964 Naval Recruits Subjected to General Surgical Procedures. C. W. McLaughlin Jr. and J. R. Brown.—p. 1025.
Renoureteral Colic with Hematuria at Advance Base Hospital. F. A. Ellis.—p. 1033.
Organic Upper Gastrointestinal Disease at an Advance Base. J. H. L. Heintzelman and H. W. Jacox.—p. 1035.
Observations on Bacteriology and Epidemiology of Acute Respiratory Tract Infections in Tropics. R. F. Norris, R. A. Kern and A. J. Musgrave.—p. 1039.
Present Status of Penicillin. G. F. Schmitt.—p. 1047.
*Filariasis Among Navy and Marine Personnel: Report on Laboratory Investigations. P. Michael.—p. 1059.
Observations on Dengue. D. A. Carson.—p. 1081.
Acute Infectious Jaundice. J. H. Willard.—p. 1085.
Psychiatric Casualties. E. H. Steele.—p. 1089.
Syncopal Reactions of Anoxic Subjects Observed in Low Pressure Chamber: Relationship to Incidence of Epilepsy; Preliminary Report. N. E. Baxter, C. S. White, D. T. Watts and W. D. Abbott.—p. 1103.
Protruded Intervertebral Disk: Advantage of Upright Position in Surgical Removal. C. H. Shelden.—p. 1107.
Dermatitis Venenata Caused by Semecarpus Atra. J. M. Hitch.—p. 1111.
Observation of Skin Diseases in Tropics. J. R. Delaney.—p. 1117.
Value of Sulfonated Oils in Treatment of Burns and Other Denuded Surfaces. W. L. Rogers, T. M. Cohen and R. R. Goldberg.—p. 1125.
*I. Dried Plasma Sheets in Treatment of Burns; II. In Treatment of War Wounds: Preliminary Reports. B. Pollock.—p. 1171.
*Food Poisoning at Naval Training Station. B. B. Breese, J. B. Stanbury and H. C. Upham.—p. 1205.

Filariasis.—Michael directs attention to the growing incidence of filariasis among marine and navy personnel returning from the South Pacific. The present study deals with lesions caused by Wuchereria bancrofti. Wuchereria malayi has apparently not been identified in any of the patients. Filariasis is a nematode infection present in tropical and semitropical areas of the world. The Samoan variety differs in lacking the nocturnal periodicity of the microfilariae. Several thousand thick and thin smears taken at various intervals during both day and night hours have proved to be negative for microfilariae. Correlating these findings with the studies made on lymphatic tissue of the patients lends support to the belief that microfilariae will probably not be demonstrated in appreciable numbers, if at all. Unquestionably at some time in the cycle of the parasite microfilariae were present in the circulating blood. It is obvious that this problem is far different from that observed in endemic areas where large masses of the native population are infected and microfilariae may be demonstrated in the blood at will. It is hazardous to guess what might have happened in 4 of the author's patients from whom lymph nodes were removed and adult female pregnant W. bancrofti worms recovered. The possibilities are decidedly lessened when the optimal factors of tropical humidity and temperature are removed by change to temperate climates. Man is the definitive host, and approximately 44 different mosquitoes may serve as host for development of the mature larvae (intermediate host). The most common intermediate hosts are Culex quinquefasciatus and Aedes scutellaris. Other less common transmitters are Culex pipiens, Aedes rossi, Aedes variegatus and Anopheles costalis. Although the symptom free period may vary greatly from one or two months to twelve months, the majority of the author's patients developed their first symptoms from seven to nine months following their initial exposure. Constitutional symptoms consist of chills, mild fever, general malaise, nausea and occasional photophobia. Patients frequently note painful swollen red areas in the extremities which later involve the adjacent lymph nodes, followed by a retrograde or centrifugal lymphangitis. A vast majority of the patients show a funiculitis with or without epididymitis, orchitis or hydrocele. The author gives a detailed description of the histopathologic changes and thinks that the importance of serial sections of lymph nodes cannot be overemphasized. From microscopic studies and the fact that he was unable to demonstrate microfilariae in the peripheral blood stream, he concludes that this disease will not become a public health problem in this country. Filariasis should be ruled out in certain atypical lymph node diseases. Lymph node and lymphatic channel biopsies of the upper extremities cause no harm and afford the best means of diagnosis. Many of the lesions of filariasis are believed to be allergic in nature as the result of filarial foci elsewhere in the body. Certain lymph node, testicular and spermatic cord enlargements, together with the so-called fugitive swellings of the skin, may be explained on this basis. No specific effective therapeutic agent has as yet been demonstrated.

Dried Plasma Sheets for Burns and War Wounds.—Pollock introduces a new method of treating burns which apparently overcomes many of the objections found with tannic acid, triple dye and other coagulants. The ideal coagulum should be durable, noncontractile, indefinitely pliable, nontoxic, nonirritant, resistant to trauma, bactericidal, painless and not unsightly and should contain fibrin. Dried plasma sheets apparently come closer to fulfilling these criteria than any other coagulum introduced. The plasma sheets were made in a Petri dish, giving a sheet 4 inches in diameter. To 20 cc. of sterile water in a Petri dish, 1.5 to 2 Gm. of dried plasma is added and dissolved, and 0.2 Gm. of sulfanilamide powder added. This preparation is dried in an oven at 140 C. until a firm sheet forms. This drying process requires fifteen to twenty minutes. It is then allowed to cool and is applied directly to the burn. It was felt that second degree burns should have layers of tissue paper thickness, and deeper wounds should have thicker layers. The plasma sheets tend to curl at the edges. This curling can be overcome by moistening the sheet with water before applying. Within a few moments the plasma sheet becomes adherent, and within a few hours strands of fibrin can be seen securing the plasma sheet to the burn. Plasma loss is stopped immediately. Dressings may be used but are not essential. Plasma sheets were used also in the treatment of indolent, ulcerating slow healing war wounds.

Food Poisoning.—Breese and his associates describe seven outbreaks of acute food poisoning in a large naval training station. In five the causative food was determined and in three bacteriologic confirmation was secured. The foods that cause illness are those which make good mediums for the growth of organisms and are generally of animal origin (meat, fish or dairy products). In addition they have usually undergone considerable handling in the preparation after the initial cooking and have been rewarmed just prior to serving or have been served cold. Foods in these categories are ham, creamed chicken or fish, meat, fish or chicken salads, croquettes, hashes and goulashes, cream filled pies and pastries. The usual deviation from the proper technic of food handling is in permitting the sliced or boned meat or the prepared food to stand for several hours at room temperature or in inadequately refrigerated ice boxes before it is served. Rewarming is insufficient, but thorough recooking just prior to serving will, despite improper handling, destroy the organisms and their toxins. The staphylococcus enterotoxin is said to withstand boiling for thirty minutes. The author outlines measures designed to prevent food borne disease.

Wisconsin Medical Journal, Madison

43:489-580 (May) 1944

Eye in General Diagnosis. S. R. Gifford.—p. 509.
Sulfonamides in Surgery. A. S. Jackson.—p. 516.
Immediate and Remote Complications of Sulfonamide Therapy. J. C. Grill.—p. 522.
Management of Premature Labor. C. J. Lund.—p. 526.
Changes in Institutional Psychiatric Practice in Past Decade: (Observations from Private Sanitarium). C. W. Osgood.—p. 532.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

1:513-546 (April 15) 1944

Review of Work of Penicillin Therapeutic Research Unit. R. V. Christie and L. P. Garrod.—p. 513.
Experiences in Systemic Administration of Penicillin. H. V. Morgan, R. V. Christie and I. A. Roxburgh.—p. 515.
*Surgery and Penicillin in Mandibular Infection. R. Mowlem.—p. 517.
*Penicillin in Bone Infections. I. M. Robertson.—p. 519.
Local Application of Penicillin in Soft Tissue Lesions. J. N. Barron and O. T. Mansfield.—p. 521.
Local Treatment of Breast Abscess with Penicillin. D. B. Fraser.—p. 523.
Penicillin in Treatment of Certain Diseases of Skin. I. A. Roxburgh, R. V. Christie and A. C. Roxburgh.—p. 524.
Laboratory Control of Penicillin Treatment. L. P. Garrod.—p. 528.

Surgery and Penicillin in Mandibular Infection.—The first group of 4 cases reviewed by Mowlem involved postoperative cases in all of which infection was either anticipated or was causing early reaction. In these cases 1,000 units of penicillin was injected daily for several days and there was early bacterial control with consequent normal healing. The second group comprised 16 cases of osteomyelitis of the mandible. In all of them infection has been gross and well established, and penicillin has been used in conjunction with radical surgery. The operation consisted in subperiosteal excision of the lower border of the bone, together with the outer plate and all the infected medullary area. Until the advent of penicillin, the overlying soft tissues of the cheek were then packed away from the bone and the cavity allowed to granulate from its depth. The sulfonamides did much to control infection, but packing still seemed necessary. When penicillin became available, it was decided to continue this radical surgery with closure of the soft tissues. This has three advantages: (*a*) The soft tissues of the cheek may be closely approximated to the underlying bone and can be expected to contribute to vascular ingrowth. (*b*) The closed cavity not only excludes secondary infection but also retains the penicillin, which is thus permitted to exercise almost continuous action. (*c*) Primary instead of delayed healing is obtained. There was considerable similarity between all the cases. A soldier presented a 2 months old sinus in the iliac crest, with induration of the surrounding tissues. Hemolytic streptococcus and Staphylococcus aureus was found, and 1,000 units of penicillin was injected daily for ten days with improvement in the surrounding soft tissue but no change in the sinus or its bacteriologic contents. At operation a small sequestrum was found in a cavity lined with fibrous tissue. From this case the author deduces that, even if sterility is obtained with penicillin, healing will not automatically follow. The fibrosis and its resultant avascularity are the determining factors, and not the infection, and this will be true of many established bone infections. Penicillin is therefore no substitute for adequate surgery.

Penicillin in Bone Infections.—Robertson explored the value of penicillin in 34 cases of bone infections. In a group of 7 cases of hematogenous osteomyelitis, all in children, with one exception penicillin was used as an adjunct to surgery. The wounds following surgical exploration were packed lightly with petrolatum gauze and enclosed in a plaster, a window being cut to allow inspection and taking swabs for culture. Systemic penicillin treatment was given by various routes, dosage being calculated roughly according to body weight and based on an adult dose of 120,000 units daily. Local application of penicillin was employed in 8 cases of chronic hematogenous osteomyelitis and 7 cases of osteomyelitis following compound fractures. The results of the local application of penicillin have been disappointing. Complete healing occurred in only 1 of these cases. In the others there was only temporary or no improvement. The author lists the following three factors as probably responsible for the unsatisfactory results: (1) failure of continuous application, (2) inaccessibility of the bone infection, (3) the presence of dead bone. In the group of compound fractures, those cases presenting a guttered wound with gross skin loss and bare bone exposed in the depths were particularly resistant to treatment, the mixed bacterial flora remaining unaltered and the healing of the wound being delayed. It is hoped to improve on these discouraging results by the more radical removal of infected bone, followed by complete closure, if necessary with the aid of a full thickness graft, and subsequent instillation of penicillin solution through a tube. Of 12 patients with miscellaneous orthopedic defects 10 were treated with the local administration of penicillin and 2 with the systemic application. The majority of the locally treated cases in this miscellaneous group responded well, possibly because the lesions were of small extent, involving mainly soft tissues, and usually not of long standing. The 2 cases treated systemically were costly failures. To judge by the results in these 2 cases, long standing sepsis involving bone must be considered an unfavorable field for penicillin treatment, either local or systemic.

Medical Journal of Australia, Sydney

1:237-260 (March 18) 1944

Health and the Gold Standard. J. Dale.—p. 237.
*Management of Established Wound Infections. H. R. G. Poate.—p. 242.
Kationic Chemotherapy, with Special Reference to Acridines. A. Albert. p. 245.

Management of Wound Infections.—Poate believes that little attention is given to the control of frank suppuration. One reason for this is the abuse of the "closed plaster" technic. Once patients have reached a base hospital where they can be retained, plaster casts should be abandoned in the majority of cases. The nauseating stench of foul wounds which characterized the primitive hospitals of pre-Lister days, and a reversion to "laudable pus," have no place in the modern treatment of infected wounds. The all pervading and sickening odor of stinking plaster permeated with blood and pus has a depressing and even demoralizing effect. The continued loss of plasma protein in running pus has a debilitating effect on the patient, and the chronic toxemia with its associated pyrexia has a harmful effect on the constitution of his blood and on his tissues generally. Plaster is invaluable in providing comfort during transport and has proved to be a life saver in many cases, but it should not be abused. Poate is chiefly concerned with deep wounds and especially with those associated with bone and joint injury. He stresses the following points in the management of established wound infection: the great importance of maintaining the hemoglobin content of the blood as near to normal as possible; the necessity for removal of all dead tissue and especially sequestrums from the depths of these wounds; the abolition of closed plaster technic in these cases once a stabilized form of treatment is available; the inefficiency of sulfonamides as local applications in the presence of frank pus; the great importance of the acridine antiseptics in the control of established and chronic sepsis; the necessity for maintaining the skin surrounding wounds in a surgically clean condition so as to prevent reinfection; the control of cross infection in hospital wards.

Bollettino d. Soc. Ital. d. Med. e Ig. Trop., Asmara

2:5-114 (No. 6) 1943. **Partial Index**

*Rheumatic Fever in Eritrea. G. Ferro-Luzzi.—p. 13.
Modes of Onset and Course of Pulmonary Tuberculosis in Ethiopians.—p. 48.

Rheumatic Fever in Eritrea.—Ferro-Luzzi studied 50 white Europeans who were living in Eritrea and presented symptoms of rheumatic fever. There were no cardiac complications in a group of patients in whom the first attack of the disease occurred when the patients were living in Eritrea or presented a recurrence of a first attack in Eritrea. Cardiac complications were observed in a group of patients in whom the attack of the disease represented a recurrence of previous attacks suffered in Europe. One of the patients in the first group died from an acute hyperfebrile form of the disease. The heart was found to be normal at a necropsy. Salicylates, iodine, arsphenamines, sulfanilamide, sodium glycerophosphate and short wave therapy failed in patients in the former group, whereas they were effective in those of the second group. The natives do not have the disease. Laboratory studies and cultures failed to reveal the etiologic agent in the patients of the first group. The author believes that the disease is a form of rheumatic fever.

Book Notices

New and Nonofficial Remedies, 1944, Containing Descriptions of the Articles Which Stand Accepted by the Council on Pharmacy and Chemistry of the American Medical Association on January 1, 1944. Issued Under the Direction and Supervision of the Council on Pharmacy and Chemistry of the American Medical Association. Cloth. Price, $1.50. Pp. 778. Chicago: American Medical Association, 1944.

Noteworthy features of New and Nonofficial Remedies, 1944, are the revision to put into effect the Council's decision to use the metric system exclusively and the addition of the chapter on contraceptives. In the opinion of many the decision to use only the metric system will appear to be the belated taking of a step which has been long overdue. Nevertheless it represents a courageous move on the part of the Council. It is to be hoped that the Council's action will hasten universal adoption of this system in this country. Concession is made to those who may be still attached to the apothecary system in the form of the excellent equivalent dosage tables which appear in the front part of the book.

The chapter on contraceptives is quite comprehensive; with the acceptance of more preparations it will undoubtedly assume a large place in New and Nonofficial Remedies. The Council has thus far accepted some contraceptive jellies and creams, contraceptive diaphragms, diaphragm inserts, syringe applicators and fitting rings. It is understood that a number of additional preparations have been submitted for Council consideration since the book went to press. This chapter again represents a courageous and long needed innovation.

Some of the new preparations that appear in this volume are Succinylsulfathiazole, a new sulfonamide, a proprietary brand being "Sulfasuxidine"; Diodrast Concentrated Solution, a preparation of the already accepted Diodrast for use in a special diagnostic procedure for visualization of the circulatory system and also cholangiography; a preparation of Sodium Benzoate for use as a liver function test; Mersalyl and Theophylline, accepted under the name Salyrgan-Theophylline Tablets, proposed as an adjunct to intravenous injection of the already accepted drug; Zinc Insulin Crystals and Zinc Insulin Injection Crystalline; Tetanus Toxoid, and Concentrated Oleovitamin A and D, a dosage of the Pharmacopeial preparation.

A glance at the preface shows that certain general articles have been revised to bring them up to date. More or less important revisions have been made of the chapters on barbituric acid derivatives, estrogenic substances, parathyroid, ovaries, sulfonamide compounds and vitamins, especially the sections on vitamin B complex and vitamin D. In this connection it is worth noting that each chapter in the book is reviewed annually, or more often if indicated, by the responsible referee for such revision.

One notes the curtailment of the section on "articles and brands accepted by the Council but not described in New and Nonofficial Remedies." It is understood that this is caused by the recent decision of the Council greatly to limit its list of official preparations and to describe in the body of the book such of the listed articles and brands as it seems necessary to retain. This again appears to be a somewhat radical and forward looking decision of the Council. Such innovations and leadership are to be commended, and the new and younger members of the Council will undoubtedly pursue these and other objectives with the same sane and competent leadership that has distinguished this body and its service to the medical profession and to society in general.

Clínica psiquiátrica. Por el Dr. Ernesto Daniel Andía, jefe del Servicio de neurología del Hospital Municipal de Avellaneda "Pedro Fiorito." Paper. Pp. 583, with 123 illustrations. Buenos Aires: Editor Aniceto Lopez, 1944.

This is a well written and complete textbook on clinical psychiatry. It is excellently illustrated and contains many good diagrams. It consists of thirteen chapters, on early conceptions, psychologic applications in psychiatry, the patient's clinical history, the patient's psychiatric findings, psychic constitutions, manic depressive syndrome, confusional states, deliriums, schizophrenia, dementias, oligophrenic syndrome, epilepsy and alcoholism. The book is up to date and is recommended to psychiatrists who have a reading knowledge of Spanish.

A Text-Book of Histology Arranged Upon an Embryological Basis. By J. Lewis Bremer, M.D., Hersey Professor of Anatomy, Harvard University, Boston. Rewritten by Harold L. Weatherford, Ph.D., Assistant Professor of Anatomy, Harvard University. Sixth edition of "Lewis and Stöhr." Fabrikoid. Price, $7. Pp. 723, with 598 illustrations. Philadelphia: Blakiston Company, 1944.

This textbook has well merited its position as one of the most important books for medical students since its first appearance, thirty-eight years ago, as the sixth American edition of "Lewis and Stöhr." That edition was written by the eminent scholar Dr. Frederic T. Lewis and has the distinction of being the first book of its kind arranged on an embryological basis. The emphasis of its contents has always been on the necessity of an understanding of the development of each organ described as an introduction to the study of the microscopic structure in the adult. This point of view has proved to be efficiently sound and has enriched the teaching of histology in American medical schools. In the course of time this fundamentally sound idea captured the attention of other authors. Today the consideration of the developmental possibilities of the constituent tissues of adult organs is accepted as common sense pedagogy. Dr. Frederic T. Lewis performed a great service for anatomy in this country in initiating and fostering this vital interpretation of histology. In the same spirit Dr. John L. Bremer presented and enlarged the book through three editions.

The present edition offers a comprehensive discussion of the essential facts of histology. It is rewritten by Dr. Harold L. Weatherford, who by training, experience, pedagogic understanding and the gift of clear, precise writing is unusually well qualified to deal with this subject matter. The author has made available to teacher and student alike the functional concept of histology; he has admirably succeeded in summarizing the recent greatly expanded experimental work in histology and embryology.

There are several distinguishing features in this edition. First there appears an excellent succinct account of the development of the microscope, a careful reading of which will profit each student. Second, there are more than 750 references covering classical as well as modern works. The interpolation of historical citations throughout the book serves to place the textual material in its proper cultural milieu. Among these references one will find the names Aselli, Bichat, Cicero, Corti, Harvey, Hooke, Kircher, Leeuwenhoek, Mascagni, Schleiden, Schwann, Willis, Winslow and Wolff in addition to the names of von Baer, Bartholin, Bell, Diemerbroeck, Eustachius, Fabricius, Fallopius, Malpighi, Pecquet, Ruysch and Vesalius, which were included in the fifth edition. Such historical references find a fitting place in a book which sets a high standard of scientific achievement and should make a strong impression on students who have an appreciation of scientific humanism. Third, the illustrations have been almost doubled, about fifty in color and all particularly well chosen to meet the needs of students. Fourth, the present editor was fortunate in having the special section on the shape of cells written by Dr. Frederic T. Lewis and the section of placentation written by Dr. George B. Wislocki.

The dynamic point of view adopted in the presentation of the contents will unquestionably make a strong appeal to students of medicine, for whom this book was originally planned, forming a sound basis for the study of both physiology and pathology. It will serve equally well, however, the requirements of students of biology not alone as a textbook but also as a tool of research.

The Romance of Medicine: The Story of the Evolution of Medicine from Occult Practices and Primitive Times. By Benjamin Lee Gordon, M.D., Attending Ophthalmologist to the Shore Memorial Hospital, Somers Point, New Jersey. Cloth. Price, $5. Pp. 624, with 147 illustrations. Philadelphia: F. A. Davis Company, 1944.

This is a learned work about the history of medicine, excellently illustrated and arranged according to a special plan. The book is badly titled, because the author has missed a great deal of what is romantic and dramatic in the development of medicine. However, his chapters on the location of the vital energy, demonology, astrology, symbolism, magic and occult healing condense much material that is not easily available in a single chapter elsewhere. Indeed, the work partakes far more of the philosophy of medicine than of romance. For the subject it discusses it is a most valuable addition to works on the history of medicine.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

ALUMINUM COMPOUNDS FOR SILICOSIS

To the Editor:—**Is there anything to the claim that aluminum dust is an antidote for silica dust and that silicosis in workers can be prevented by treating them with aluminum dust?**

M.D., Troy, Ohio.

ANSWER.—Amply confirmed experimental evidence both in Canada and in this country proves that inhaled metallic aluminum and amorphous aluminum hydroxide will completely neutralize the toxic action of quartz on living tissue. Given prophylactically before the quartz tissue reaction, it will limit the process to simple phagocytosis with no subsequent fibrosis; given after the quartz, aluminum and its amorphous hydrate will arrest the development of silicosis and cause resolution of immature nonfibrous lesions. Treatment does not dissolve silicotic nodules that have already attained maturity. Experience in North America fails to confirm the German reports that aluminum produces any serious effects on the lungs. A limited clinical experience indicates that some cases of silicosis are relieved of symptoms by aluminum therapy. It remains to be proved whether or not certain nonsilicious materials often associated with quartz in industrial dusts may interfere with the inhibitory action of aluminum. Theoretical and clinical evidence suggest that they may and thus may explain some of the failures that have been reported.

PREGNANCY IN WOMAN WITH DOUBLE UTERUS AND CERVIX

To the Editor:—**A woman aged 29 who is in her eighth month of pregnancy has a double uterus and a double cervix, which malformation probably corresponds to the uterus bilocularis as illustrated in De Lee's "Principles and Practice of Obstetrics," 1940, page 593, or to the double uterus with double cervix of Taylor, as quoted on page 192 of the 1943 *Year Book of Obstetrics and Gynecology*. An anteroposterior vaginal septum was removed following spontaneous abortion at two and a half months about two years ago, the septum having been discovered prior to the first pregnancy. The first pregnancy was in the left uterus, and apparently this pregnancy is in the same side. Although I am treating the patient expectantly, I am aware of some of the antepartum as well as the postpartum complications. *The Year Book of Obstetrics and Gynecology, 1943*, mentions some of them, although it makes no suggestions as to the proper treatment of these cases. I am also aware of the fact that a good many women with similar malformations have gone through labor normally. When she miscarried nearly three years ago she had a severe hemorrhage following the expulsion of the placenta, for which hemorrhage she had to have a blood transfusion. My patient has just finished her eighth month of pregnancy, and it would be highly appreciated if you would please refer this case to an authority on the subject. Pelvimetric measurements appear to be normal. The patient has always been moderately anemic (hypochromic, normocytic anemia). Would it be advisable to perform a conservative cesarean section as soon as labor starts if the fetus is viable? Would you please give opinions of the proper authorities?**

M.D., Wisconsin.

ANSWER.—A patient like this should be treated expectantly just as a patient who has a single uterus and a single vagina. An elective cesarean section is definitely not indicated. Dystocia does not occur frequently enough in such cases to warrant this radical procedure as the method of choice. In De Lee-Greenhill's Textbook of Obstetrics (ed. 8, Philadelphia, W. B. Saunders Company, p. 534) expectancy is the treatment recommended for this type of case. Stander (William's Obstetrics, ed. 8, p. 712) says that ordinarily there is no interference with the course of pregnancy, and spontaneous labor may be looked for. Much more rarely the nonpregnant horn may block the pelvic cavity and give rise to dystocia similar to that produced by tumors of other origin. Of course, in such cases cesarean section must be performed. Palmer Findley (*Am. J. Obst. & Gynec.* **12**:318 [Sept.] 1926) collected 132 cases of uterus didelphys from the literature and added 3 of his own. All represented a complete doubling of the uterus, cervix and vagina and all the patients had been pregnant. These 135 women had 217 full term babies. In 83 cases spontaneous delivery occurred, in 23 cesarean section was performed, 22 women were delivered by forceps or version and extraction, and so on.

In women with this abnormality, abortions are fairly common and labor is prolonged as a result of poor muscular development in the uterus, small rigid cervix and the encroaching nonpregnant uterus. Since spontaneous delivery is the rule, the management of pregnancy and labor in the uterus didelphys should not differ from that of pregnancy in the normal uterus save in the event of complications.

TRICHOMONAS WITH MIXED VAGINAL FLORA

To the Editor:—**In a case of a mixed infection involving and causing a severe leukorrhea in which both Trichomonas hominis and Escherichia coli have been identified, what laboratory method might be used to identify Trichomonas hominis in the stool? In this case, in which the intestinal flora has been altered by the prolonged use of bismuth beta-naphthol, Escherichia coli could be obtained from the vagina, the cervical canal and the external meatus. What medicament can be recommended for the destruction of Escherichia coli, at least to the extent that it would not be so abundant as to cause uncomfortable symptoms of itching and mucosal irritation of the external urethral meatus and the vaginal mucosa? Does the presence of either Trichomonas hominis or Escherichia coli alter the vaginal acidity? If so is there any concept as to how the clinician may use the altered acidity? I would appreciate also some references.**

M.D., New York.

ANSWER.—Considerable controversy still exists on whether Trichomonas hominis can cause vaginal trichomoniasis. Some maintain that it is solely an intestinal inhabitant. The clinical entity of vaginal trichomoniasis in association with Trichomonas vaginalis is established. It is quite possible that more than one species of tetratrichomonads may be found in the lower bowel. Thus the necessity for appropriate cultural and morphologic studies are evident.

Escherichia coli may be found frequently in the vagina and vulva. Consequently its presence about the external urethral meatus does not establish pathogenicity. If the urinary tract is completely normal and free from infection and the cervix is perfectly normal, the colon bacilli will disappear as soon as a normal healthy vaginal condition is restored. The normal healthy vagina during the reproductive period of life (excepting at the time of menstruation and shortly after delivery) is normally acid. There is no established incidence of pathologic hyperacidity of the vagina. The vagina in a healthy state is associated with a great preponderance of vaginal bacilli or Doederlein's bacilli. It is agreed by most workers that the pronounced acidity is related to the carbohydrate content of the vaginal epithelium and normal physiologic bacterial action. Trichomonas vaginalis presumably will not survive in a p_H environment of 4.5, and sharper acidities seem unfavorable to the colon bacilli.

It is assumed that the organism Trichomonas hominis mentioned may be Trichomonas vaginalis, but in any event the use of alpha or beta lactose in tablets or capsules daily for from two to six weeks and gradual reduction as improvement occurs will produce a high incidence of favorable responses. Douches, table salt (4 tablespoons to 1 quart of water) or alum (1 heaping teaspoon to 1 quart of water) may be used once weekly. Douches are not very effective therapeutically and remove the evidence without correcting the cause. Where there are focal infections in the patient's urethra or bladder or in the cervix, appropriate therapy to these sites may be necessary to prevent recurrence.

The attempt to alter the acidity by acid douches has been successful in some investigators' hands, but an excessive acidity may be detrimental to the normal bacterial flora. The normal vagina will develop its own healthy state unless there are factors which prevent it.

References:

Hegner, Robert: *J. Parasitol.* **14**: 261 (June) 1928; **16**: 47 (Sept.) 1929; *Am. J. Hyg.* **8**: 16 (Jan.) 1928.
Hogue, M. J.: *Am. J. Hyg.* **8**: 85 (Jan.) 1928; *Am. J. Trop. Med.* **6**: 75 (Jan.) 1926.
Cleveland, L. R.: *Am. J. Hyg.* **8**: 256, 1920.
Bland, P. B., and Rakoff, A. E.: *Rev. vida nueva* **37**, May 15, 1936.
Allen, Edgar; Jensen, L. B., and Wood, I. B.: *Am. J. Obst. & Gynec.* **30**: 565 (Oct.) 1935.
Hesseltine, H. C.; Wolters, S. L., and Campbell, Alice: *J. Infect. Dis.* **71**: 127 (Sept.-Oct.) 1942.
Hesseltine, H. C.: *Am. J. Obst. & Gynec.* **40**: 641 (Oct.) 1940.

XANTHINES FOR CORONARY DISEASE

To the Editor:—**Is there any evidence that, in the treatment of coronary disease either before or after infarction, the type of xanthine series drugs ought to be changed frequently or at all? For example, if the patient is taking aminophylline for two months or so is there any advantage in changing over to some other type of drug of this series?**

M.D., Wisconsin.

ANSWER.—On the basis of experimental and clinical observations, it is likely that prolonged administration of xanthines or habitual use of coffee or tea will often confer a relative diuretic unresponsiveness to xanthine derivatives. However, little is known with regard to the coronary action of these drugs. The controversial literature on this subject has been critically

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reviewed by Boyer (THE JOURNAL, May 29,.1943, p. 306) under the recommendation of the Council on Pharmacy and Chemistry. The evidence that xanthine derivatives exert any favorable influence on experimental and spontaneous coronary disease was found to be inadequate and inconclusive. Obviously before the coronary action of xanthines is elucidated nothing can be stated with finality on the development of fastness to these drugs.

APHAKIA

To the Editor:—An aphakic eye requires about a plus 10.0 sphere correction. Is this all due to the replacement of the lens by a corresponding increase in the volume of the aqueous or has the distance from the anterior to the posterior pole of the eye been decreased? Textbooks give the index of refraction of the lens as from 1.386 to 1.406 at the core and of the aqueous as 1.336. This does not seem to be enough to shift the second principal focus by 4 mm. Is the length of the eyeball increased on accommodation?

M.D., Pennsylvania.

ANSWER.—The changes in aphakia apparently are due to the removal of the lens and not to the replacement of the lens by a corresponding increase in the volume of the aqueous or a decrease in the distance from the anterior to the posterior pole of the eye.

The lens in normal position is equivalent to a + 20. D. lens (Gullstrand's schematic eye is 19.11 D. and Tscherning's lens is 21.39 D.), but when the lens is removed it requires only an approximately + 10. D. lens to correct an eye which was emmetropic. This is mainly because of the fact that the lens is placed 13 mm. anterior to the cornea, which greatly enhances its action. There are two principal reasons why a + 10 diopter lens placed before the eye is equivalent to the + 20 diopter lens of the eye. One is the increase of the focal distance, i. e. from the lens to the retina, and secondly the lens placed before the eye has a much greater relative refractive index. The lens in air has a relative refractive index of 1.345 to 1, while the ratio of the average effective index of the lens, 1.44, to that of aqueous and vitreous, 1.336, is much less. Divers must have special lenses because their vision becomes blurred when submerged in water. The water has practically the same index of refraction as the aqueous. Fishes overcome this by having an almost spherical lens. An estimate of the correction of an aphakic eye can be obtained by adding + 10.00 D. to one-half the power of the required glass previously necessary to neutralize existing ametropia.

There are a number of theories concerning the accommodation of the eye. According to the Helmholtz theory, accommodation is caused by relaxation of the zonule, which permits the lens to become more convex. In the Tscherning theory traction on the zonular fibers is postulated and the lens becomes more convex because of the resistant nucleus and structure of the anterior capsule. Most authorities believe that the accommodative act merely produces change in the curvature of the lens and do not believe that the length of the eyeball is increased in accommodation.

ANAL INSTILLATIONS AFTER HEMORRHOIDECTOMY

To the Editor:—Following the surgical removal of internal hemorrhoids in which raw surfaces remain in the anal canal and lower rectum, would instillation of 30 cc. of 1 per cent aqueous solution of mercurochrome result in sufficient absorption to cause toxicity? Would mercurochrome used in the lower rectum following hemorrhoidectomy have any bacteriostatic property? Following hemorrhoidectomy would 30 to 60 cc. of 2 per cent aqueous solution of sodium chloride instilled in the lower rectum have any bacteriostatic property?

Lieutenant Colonel, M. C., A. U. S.

ANSWER.—The procedure outlined would not be toxic unless the patient is sensitive to the drug. The drug would not be bacteriostatic since there would be little contact with the denuded areas which are within the anal canal. The solution of sodium chloride would not be bacteriostatic, although it might have some mechanical cleansing value.

PROGRESSIVE MUSCULAR ATROPHY

To the Editor:—Will you give me information on the treatment of progressive muscular atrophy? I have under treatment a middle aged man who for the past two years has shown a progressive atrophy of the muscles of the right upper extremity. During the past few months atrophy of the right thigh has been noted. Muscular twitchings have been noticed frequently. He has received thiamine hydrochloride 100 to 200 mg. intramuscularly and intravenously twice a week. He has been taking vitamin E synthetic 200 mg. daily by mouth, also vitamin A 100,000 units daily by mouth.

Edward H. Weiser, M.D., Sussex, N. J.

ANSWER.—Besides the use of vitamins, particularly vitamin E, and thiamine, already used in the case described, there have been no additional forms of treatment suggested recently for progressive muscular atrophy.

PERSISTENT LACTATION

To the Editor:—A white primigravida, primipara, aged 30, married, had a normal pregnancy, delivery and postpartum period four years ago. She nursed her child for eight months and since then has had a continuous profuse flow of breast milk. She feels perfectly well and is able to work in a war plant and do her own work at home. She had scarlet fever, measles and chickenpox between the ages of 2 and 8. There have been no serious illnesses since then except for an occasional upper respiratory infection. One year ago she was treated for obesity and states that she lost 20 pounds (8 Kg.) in six months. At that time she was given injections, the content of which is unknown, and oral medication consisting either of thyroid or of amphetamine. The menarche began at 12; periods last from twenty-eight to thirty days; there is a three to five day flow, normal in quantity, with a slight dysmenorrhea. There has been no change in menstruation in the past four years. There is no similar lactation history in the rest of the family. The breasts are large, firm and pendulous, without masses; the nipples are erect, with moderate pigmentation of the areola. A thick, white, milklike secretion appears at the nipple ducts on slight manipulation. The heart rate is 72 per minute, with regular rhythm. There are no murmurs or enlargements. The blood pressure is 130/80. There is a slight laceration of the cervix; the uterus is normal in size, shape and position; the adnexa are normal. The red blood count is 4,900,000, hemoglobin 85 per cent; the white blood count, 7,400; polymorphonuclear cells 72 per cent, lymphocytes 18 per cent, eosinophils 2 per cent, basophils 1 per cent and monocytes 7 per cent. No basal metabolic test has been made.

M.D., New York.

ANSWER.—Except for the patient being overweight, the information conveyed in this query shows that the woman is normal. Her menstruation is normal. There is no record of her basal metabolic rate. Obesity has nothing to do with this continued lactation.

It might be well to give the patient 25 mg. of testosterone propionate every other day for six injections. Then one should wait two weeks to see what effect this has on lactation. If it checks the flow, she does not need any further treatment. If there has been no change at the end of two weeks the treatment should be repeated as before.

If the full twelve injections are necessary it may be best to have more information on the patient or to know what reaction she had from the testosterone before more treatment is given.

There are some treatments for lactation which date previous to the advent of endocrinology, such as that with belladonna. These can be found in a good book on gynecology.

MALIGNANT NEPHROSCLEROSIS AND CHRONIC GLOMERULONEPHRITIS

To the Editor:—Could you please refer me to any literature or pathologic reports concerning the superimposition of malignant nephrosclerosis on a kidney previously suffering with chronic diffuse glomerulonephritis?

Captain, M. C., A. U. S.

ANSWER.—The following articles cover the subject of the association of malignant nephrosclerosis and chronic glomerulonephritis:

Horn, Henry; Klemperer, Paul, and Steinberg, M. F.: Vascular Phase of Chronic Diffuse Glomerulonephritis, *Arch. Int. Med.* **70**: 260 (Aug.) 1942.

Derow, H. A., and Altschule, M. D.: Nature of Malignant Hypertension, *Ann. Int. Med.* **14**: 1768 (April) 1941.

Ellis, Arthur: Natural History of Bright's Disease, *Lancet* **1**: 1 (Jan. 3), 34 (Jan. 10) 72 (Jan. 17) 1942.

Mansfield, J. S. Mallory, G. K., and Ellis, L. B.: Differential Diagnosis of Bright's Disease, *New England J. Med.* **229**: 387 (Sept. 2) 1943.

THERAPY OF BONE LESIONS OF MULTIPLE MYELOMA

To the Editor:—A man with multiple myeloma suffered a fracture of the twelfth dorsal vertebra and the right clavicle about eight months ago. The x-ray examination shows that these have healed, but he is still in considerable pain in his back and is very weak. He is confined to bed most of the time. Is there any treatment that will help him?

S. Ross Jones, M.D., Port Arthur, Texas.

ANSWER.—Roentgen therapy to the areas shown to be involved in the x-ray films usually results in relief of pain. Because of their radiosensitivity the bone lesions of multiple myeloma generally respond favorably and often heal following roentgen therapy.

CONTRACEPTION AND STERILITY

To the Editor:—Will you please tell me whether or not modern methods of contraception are a cause of future sterility or disability.

M.D., New York.

ANSWER.—There is no evidence that modern methods of contraception such as the diaphragm with jelly, jelly alone, suppository or sponge with foam powder are a cause of future sterility or disability.